

Center for Digital Imaging

Leica Digilux 2 Field Guide

A practical guide to the
Leica DIGILUX 2 camera.

- How your camera works
- Configuring your computer
- Digital imaging basics
- Printing your images
- Working with raw files
- Creative techniques



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For Instructors

We have created this guide as a tool to assist people with the learning curve associated with making the transition to digital imaging. While the book is primarily focused on the Leica Digilux 2, many of the computer and third-party components are useful for any digital workflow. If you would like to reproduce this book in whole or in part for classroom use, contact Scott Geffert at Center for Digital Imaging Inc., P.O. Box 4495, Grand Central Station, NY 10163 or via e-mail: scott@cdiny.com. Center for Digital Imaging Inc. also offers customized training and presentations for schools, cultural institutions, and corporations.

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All images in this book were created using the Digilux 2 camera.

Introduction

The LEICA DIGILUX 2 represents an important juncture in digital photography. To date, most digital camera manufacturers have attempted to make photography easier by removing traditional photographic controls, and replacing them with simplified fully automatic "point and shoot" controls. While an argument may be made that this was a step in the right direction, something important was lost in the process.

The ability to manually alter the basic photographic parameters increases the chances of creating a technically imperfect image, but also gives the photographer full creative control. The Digilux 2 gives the photographer the ability to explore the powerful mix of traditional photographic techniques and digital imaging.

This guide has been created to help photographers explore the wide range of creative controls available using the Digilux 2. While the camera manual clearly describes the camera functions, we have structured this guide based on the various photographic situations you may encounter, and the camera controls that will help you accomplish the desired effect. In addition, we will introduce you to some tried and true methods for working with your digital files on the Apple® Macintosh™ computer platform using popular output devices and software applications.

While this guide will not replace years of experience in digital imaging, it will help you get the most out of your Digilux 2 purchase.

We hope you enjoy using this guide,

Scott Geffert

President, Center for Digital Imaging Inc.



Table of Contents:

Chapter One

Getting to Know Your Digilux 2 Camera

How your camera works.....	6
Raw data format	7
Camera capture parameters.....	7
Analog controls	7
Digital controls.....	7
Capture and playback/review	8

Automatic Settings

Automatic focus.....	8
Program auto exposure	8
Aperture Priority auto exposure	8
Shutter Priority auto exposure	8
Color Balance.....	8

Manual Settings

Manual focus	9
Manual exposure.....	9
Custom white balance	9
EV exposure compensation	9
Flash EV exposure compensation	9

Chapter Two

Configuring Your Computer

The Digilux 2 and your Macintosh™	11
Connecting the camera for direct downloading.....	11
Disconnecting the camera after direct downloading	12
Working with an external card reader or PCMCIA adaptor	12
Working with raw images.....	13
Downloadig raw files to your computer	13

Chapter Three

Digital Imaging Basics

Bit Depth	15
Color Space	15
Histograms and Levels dialogs.....	15
Exposure	16
Color Balance.....	16
ICC color calibration	17
ICC workflow model	17
Calibrating your display	18
Defining your working space	18
Evaluating your digital images.....	18
Editing suggestions (Adobe® Photoshop™ CS)	19
Archival printing using an Epson® 2200 Printer	20

Chapter Four

Working With Raw Image Files

Software tools for editing your raw images.....	23
Editing images using Adobe® Camera Raw™	23
Editing images using SilverFast DC.....	26

Chapter Five

Creative Techniques

Night / Low Light Photography	34
Sports Photography	36
Portraiture Tips	37
Studio Lighting	38
Backlighting.....	39
Backlighting in Manual Mode.....	41

Chapter Six

Common Photographic Problems.....



Chapter One

Getting to Know Your Digilux 2 Camera

Getting to Know Your Leica Digilux 2 Camera



How your camera works

Before we begin to explore the features and operation of the Digilux 2 camera, it is best to understand the underlying process of how the camera creates, interprets and stores digital images. Very few digital photographers take the time to consider the process of capture and therefore place too much emphasis on post-capture editing on the computer. In this brief overview you will quickly learn that a high quality digital image starts in camera, not in your computer. Once you familiarize yourself with the camera functions, you will be amazed at the quality that may be achieved with little or no editing on your computer.

The Digilux 2 is equipped with a 5.0 Mega pixel sensor. 1900X2560 individual CCD sensor elements are arranged in an area array. At its most simplistic level of function, the individual sensor elements may be compared to individual analog light meters. Light passing through the lens energizes individual sensor elements which create analog voltage signals. These signals are translated to digital values via an integrated A/D converter using a linear transformation at 12bits per pixel. This means that each individual sensor element signal may translate to any of 4096 individual tonal values from light to dark per color channel.

Color information is gathered at capture via a matrix of primary color filters on the surface of the sensor. This color information is applied to the original capture data via a complex algorithm that interpolates color information and assigns color values to each pixel. While digital cameras are generally compared by how many pixels are on the sensor, very few digital photographers realize that the real quality lies in optical design, and the quality of software engineering applied to the raw sensor data.

When shooting in any of the three JPEG file format modes, the captured data is temporarily stored in an internal memory buffer as the color matrix data is processed internally.

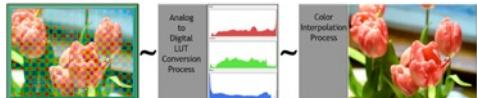
When you perform a custom white balance, image sharpening, or other in camera image adjustments; the sensor data is altered as the cameras internal color LUT is remapped to the sRGB color definition, and JPEG data compression occurs. Once the image processing occurs, the data is written to the removable media and the internal memory buffer is cleared for the next exposure. This entire process takes place in the moments after you take a picture.

When shooting in JPEG mode your in-camera processing choices directly affect your final image quality and are irreversible. JPEG compressed image files may deliver excellent results with careful attention at capture. The downside of the JPEG format is that in-camera mistakes in exposure and color balance that require editing on the computer may quickly degrade the ultimate image quality.

When capturing images in the raw file format, sensor data and other descriptive information is saved in a high bit-depth TIFF file format with no compression. One would think that with no processing overhead, this would actually be a faster process, but the fact is that the data is written directly to the memory card from the camera memory buffer. Essentially your camera is copying a 12MB TIFF file to your storage medium. This lag time is the same as if you copy a raw file to your desktop computer from the storage medium.



Raw data format



The benefit of capturing raw data is simply that you may compose and capture images, and rest assured that you will be able to reinterpret the data with little or no loss of quality. Capturing in the raw format mode of any digital camera is similar to shooting color negative film as opposed to color transparency film. Color negatives may be printed interpreted in many ways, as transparency film is more literal and is less forgiving in terms of exposure. As the raw format does not lend itself to everyday capture situations, we prefer to use the feature when shooting in more challenging situations such as night shots, and studio still life images where absolute quality is required.

Note: The Digilux 2 may be easily switched between the two file format modes, so we suggest that you should always begin in JPEG mode, and use the image review features, to arrive at the ideal capture settings. Once you have arrived at the best settings, simply switch to raw mode and create your final raw image.

Camera capture parameters

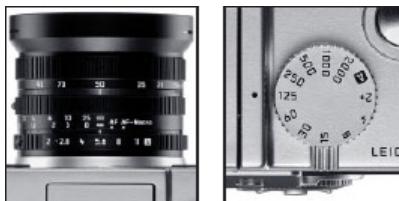
The Digilux 2 has a wide array of capture parameters. We have broken these down into two categories: analog and digital.

Analog settings directly affect the raw image data and thus are critical to high quality imaging. Digital parameters come into play primarily for files captured in the JPEG modes as the decisions you make at capture are permanently processed into the resulting files.

Analog controls

Analog controls are the same controls that one would use for traditional photography. These controls are critical to both raw and JPEG file format capture.

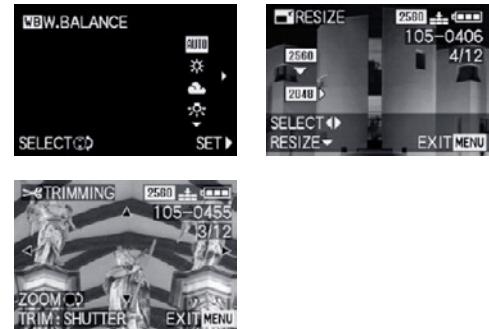
Shutter Speed (Manual or Automatic)
Aperture (Manual or Automatic)
Focus (Manual or Automatic)
Flash (Five modes)



Digital controls

Digital Controls are unique to digital photography. Used properly, the various parameters may make or break the success of a digital capture in the JPEG mode.

White Balance
Contrast Settings
Manual Color Temperature
File Compression
Black & White or Color Mode
Sharpening
Saturation

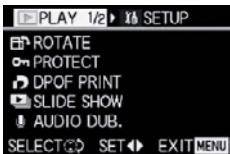


Keep in mind that when shooting in JPEG file format all of the digital controls of your camera permanently alter the captured image data.

While you may edit images on your computer, even minor adjustments to color, density, and image size will quickly degrade the final image quality.

When shooting in JPEG mode we strongly recommend that you review your images using the cameras display for exposure and color.

Capture and playback/review



You may switch between capture and playback modes using the selector on the rear of the camera, or you may temporarily jump into a quick preview mode by using the quick selector button. This feature is very useful when you are trying to confirm focus of other camera settings.

Automatic Settings

Automatic focus

If you wish to set the camera to auto focus mode, rotate the focus ring to the AF or AF-Macro setting. The focus ring has a locking button to ensure that the focus mode is not inadvertently changed when shooting. The AF mode provides rapid focussing from 60cm to infinity. The AF-Macro setting provides auto focus across the camera's entire focus range from 30cm to infinity.



Program automatic exposure

Setting the aperture and shutter controls to the "A" position enables the automatic exposure mode. The Aperture ring has a locking button to ensure that the mode is not inadvertently changed when shooting. The camera will find the best combination of aperture and shutter speeds based on the metering mode selected. (see metering modes)



Aperture Priority automatic exposure

If you would like control of focus depth of field by forcing a fixed aperture, select the aperture you wish to use, and the Digilux 2 will find the correct shutter speed based on the metering mode selected. (see metering modes)



Shutter Priority automatic exposure

If you would like to experiment with the effects of motion in your scenes set the aperture ring to the "A" position and select the desired shutter speed. The Digilux 2 will find the correct aperture based on the metering mode selected (see metering modes). In low light, various shutter speeds may be combined with the camera's flash modes for a wide range of in-camera effects.



Color Balance

When in automatic mode, the color temperature of the light falling on the camera's white balance sensor is constantly measured until the moment your shutter is released. If you shoot under mixed lighting conditions, the color balance may be set to one of five color temperature presets. These color presets may be manually adjusted to fine tune the color response. Additionally, you may choose to set a custom white balance. (see performing a custom white balance)

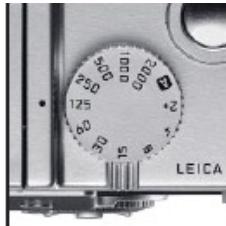
Manual Settings

Manual focus

Manual focus is one of the joys of using the Digilux 2 camera. Simply turn the focus ring past the automatic lock, and you are free to focus from any distance from two feet to infinity. To assist with manual focus the Digilux 2 is equipped with a digital focus magnifier. This unique feature may be enabled under the camera's setup menu. When the focus magnifier is enabled, each time you move the focus collar on the lens, you will be presented with a real-time window showing your image detail in the center of the frame. As soon as you touch the shutter button, the frame is returned to the full view.

Manual exposure

Setting BOTH the aperture and shutter dials on a setting other than "A" places the camera in Manual mode. When using the manual controls, you may use the camera's meter and histogram to evaluate the exposure.

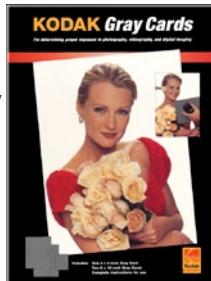


Note: If you are creating still life images, or copy work under fixed lighting conditions, you may use an 18% grey card to assist in finding the optimum exposure setting. If you photograph an 18% grey card and fill the frame, adjust the aperture or shutter speed (or both) to a point where the image histogram peak falls midway between highlight and shadow, or you may use the light balance meter on the camera display.



Custom white balance

If you use an 18% grey card to set your exposure under controlled lighting situations, you may choose the custom white balance setting to allow the camera to automatically conform color balance to your specific lighting. When you select the custom white balance mode, you will be prompted to take a picture. When this exposure is made, the camera adjusts the color values to be equal for red green and blue channels resulting in a neutral white point. This balance setting will be held for subsequent image captures, until the process is performed again, or until the battery is removed.



EV exposure compensation

When automatic exposures are thrown off by predominant light or dark areas in relation to your subject the EV compensation control is the best way to compensate. Pressing the EV compensation button on the back of the camera will bring up an on-screen window. Turning the control dial adjusts the exposure bias lighter or darker in 1/3 stop increments.



Flash exposure compensation

When working with the built-in flash in the direct or bounce position, you may vary the output of the flash unit to match your ambient light exposure level. The menu is accessed by pressing on the EV button three times. (The selection will toggle through the three menus options of EV adjustment, bracketing and flash EV adjustment). When the flash EV adjustment is selected, you may use the control dial to bias the flash exposure in 1/3 stop increments.

Chapter Two

Configuring Your Computer

Configuring Your Computer



This guide has been created specifically for use with the Apple® Macintosh™ computer running MAC OS10.3 (Panther). Apple® computer has played an important role in the photographic community as the operating system is tightly integrated with the hardware itself. This integration allows us to focus on common settings that may be applied across many models. While options specified in this section may translate to the PC platform, keep in mind that each PC computer is shipped with a dizzying array of software tools, display cards, and drivers that make it difficult to define compatibility within the scope of this guide.

The Digilux 2 and your Macintosh™

When working with the Macintosh™ computer and the Digilux 2 less is more! This means that as long as you are using the latest version of the MAC OS (currently version 10.3) you do not need to install any driver software to download or view images.



The iPhoto™ software application that comes bundled with every Macintosh™ computer is a wonderful tool for working with your digital images, and may serve as your "home base" for your collection of digital images.

iPhoto™ is easy to use, and is well documented so you may take the steps in our guide, and build upon this basic information at your own pace. iPhoto™ does not currently recognize the Digilux 2 raw format image files, but we explain how to work with raw files later in this section.

You will need the following items to connect to your computer:

- The USB to camera cable (supplied)

Note: You may also use a third-party USB or Firewire External SD card reader. Laptop users may choose to use a SD to PCMCIA adapter.



Connecting your Digilux 2 for direct downloading

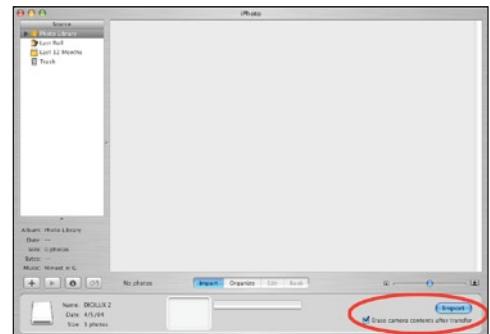
- Set the Digilux 2 to Playback Mode
- Confirm that the Digilux is in the "Mass Storage" or "PTP" USB Mode. This parameter may be found on the second page of the playback setup menu options.
- Open the cover on the left side of the camera to expose the USB port, and insert the cable to your camera, and an available USB port on your computer.
- In a few moments, the Macintosh™ will recognize the camera, and will automatically launch the iPhoto™ application.



Note: The first time you launch iPhoto™ by a direct camera connection, the operating system will ask you if you wish to use iPhoto™ when connecting your camera.

We suggest that you click the "Use iPhoto™" button. You may always change this preference down the road.

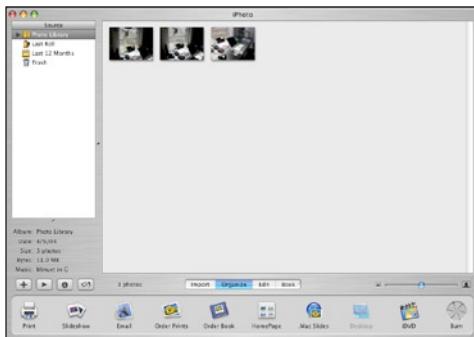
Once iPhoto™ launches, you will notice an "Import" button on the lower right of the iPhoto™ window. Clicking this button will begin importing all of the images from your camera to the computer. By default, the software is set to leave the images on your card untouched. If you click the option to "erase camera contents after transfer", the images will be deleted from your camera upon successful download.



- iPhoto™ will present a confirmation dialog giving you a second opportunity to delete the original images from the camera card. Choose Delete Originals.



- Once the downloading process is complete, your images will be shown in a contact sheet view, and all iPhoto™ functions will be available.



- During the download process, all of the transferred images are placed in the following default location on your host computer:

Macintosh™ HD:Users:(Your)Home Folder:Pictures:
iPhoto™ Library. Within the iPhoto™ Library your images
are parsed into folders based on the capture date.



Note: As iPhoto™ only recognizes the JPEG format
Digilux 2 images, any raw files will be skipped and will
not be deleted from your card. The following dialog
will verify the skipped files.



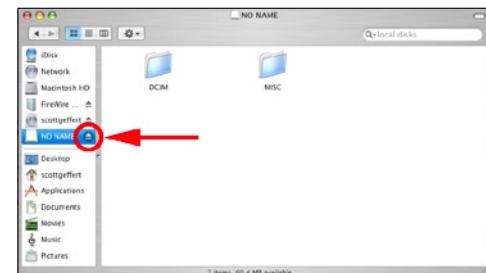
Disconnecting your Digilux 2 after downloading

When you plugged your camera into the Macintosh™, the computer recognized the camera as a "Mass Storage Device". You may have noticed a generic drive icon appear on your desktop called "NO NAME" during the connection process. As with all removable media, you need to properly remove the device to avoid possible data corruption.

If you accidentally or improperly remove your camera or media from the computer you will be presented with the following dialog:



To properly remove the device from the desktop you may click on the "NO NAME" drive icon, and drag it over the trash can icon on the dock. The word "EJECT" will appear as you drag the icon over the trash-can icon. You may also remove the camera by double clicking on the "NO NAME" Drive Icon, and clicking the eject button next to the device in the Finder window.



Working with an external card reader or PCMCIA SD card adaptor



The Mac OS and iPhoto™ will recognize the inserted media, and will operate exactly as if you connected to the camera via the USB cable. When you wish to remove the media from the card reader or PCMCIA slot follow the same process as disconnecting the camera for ejecting removable media.

Working with raw image files

We have mentioned the benefits of capturing raw image files throughout this book. As raw image files do not automatically download to your computer when you connect the camera we have outlined a process you could follow to manage your collection of images.

Downloading raw files to your computer:

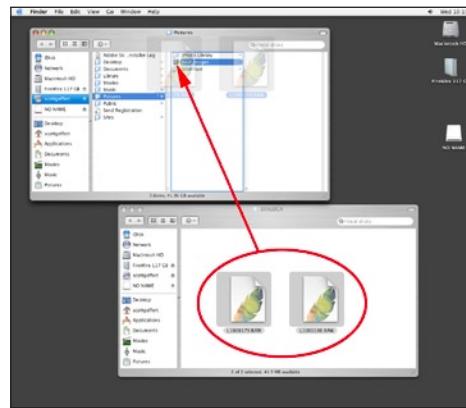
When set to raw file format mode, your Digitlux 2 captures a raw file as well as a JPEG file with the same name and a different extension. This is useful because iPhoto™ (and most other image browsers) will not be able to create a thumbnail of the raw file. Since the import process automatically moves all of the JPEG images to your computer, and may delete them from your card as part of the process, your card will be left with just the remaining raw files

As we mentioned in the instructions for downloading images in the previous section, Apple®'s iPhoto™ will present the following warning dialog when it encounters the unreadable raw format image files.

We suggest that you create a new folder in your Pictures folder called raw Images.



Whenever you see the "Unreadable Files" dialog you should MANUALLY copy any raw files from your card to this folder. By using this method, you will be able to quickly access your raw image files for editing.



To make accessing your raw files easier, you may drag the raw file folder to the right portion of your dock. This way you will not have to dig through folders on your hard drive to see your image files.



Note:

You may also wish to create a third folder for edited images in your pictures folder for images derived from your raw files. This folder may also be placed in your dock for easy access. You could call this folder "Finals" or some other meaningful name.

Chapter Three

Digital Imaging Basics

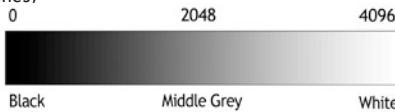
Digital Imaging Basics

Before we begin discussing how to use your images on the computer, we feel that it is important to understand what is going on under the hood.

As we discussed in the beginning of this guide the Digitlux camera delivers a processed JPEG or a raw format image file. While we reviewed the basic concepts of how the images are created in your camera, in this section we will explain how the images inter-operate with your computer.

Bit Depth

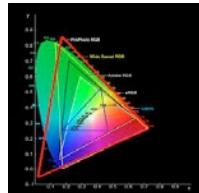
Describes how many individual tones may be stored in a digital image file. In the case of the Digitlux 2 the 12 bit capture depth yields 4096 individual tones per color channel. Bit depth has a direct impact on the usable dynamic range (or difference between the lightest and darkest point that may be recorded by the sensor). JPEG files reduce the bit depth to 8bits per pixel (256 tones)



Color Space

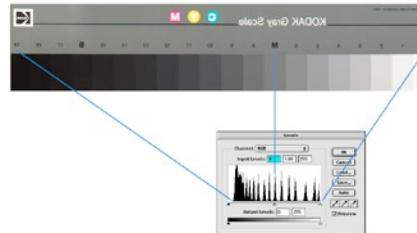
Describes the potential range of color information that may be stored in a digital image file. Usually expressed as a pre-defined ICC (International Color Consortium) color profile. Most consumer and professional digital cameras that record in the JPEG file format utilize the sRGB color space as the default color definition. sRGB is the default color space of Adobe® Photoshop™ and is the assumed color space for many common output devices. While sRGB has become the industry standard,

it is not capable of containing all of the colors that may potentially be captured with the camera's sensor. For the purposes of this guide we will base the examples on the sRGB color space. If you wish to explore working with alternate color spaces for your workflow, you will need to capture in the raw file format mode. A more detailed description of the ICC color workflow model may be found later in this chapter.



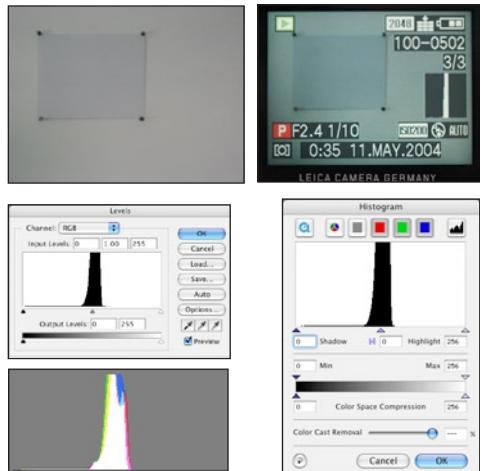
Histograms and Levels dialogs

In order to give users a graphic representation of captured tonal values, most digital cameras including the Digitlux 2 incorporate a levels dialog. The levels display on the Digitlux 2 or any other image editing application is a histogram that indicates the frequency of captured tones from dark to light (usually presented with the darkest point on the left, and the lightest point on the right).



In the example below we photographed a Kodak 18% grey card against a grey background. You will notice that the peak in the middle of the camera histogram display represents the gray values. The peak is high because there are many gray tones in the image. If the scene included black or white subjects, the histogram would indicate peaks to the left and right of the middle gray values.

The images below represent the gray scale image histogram in Adobe® Photoshop™, LaserSoft® SilverFast™, and Adobe® Camera Raw™. Each application interprets the data slightly differently, but the general shape and balance remains the same across all applications.



Note:

The image histogram of a properly exposed 18% gray card will be centered in an image histogram

Exposure

Exposure in digital photography is elusive for many users. Often times an image will look different across several computers and output devices. This variance leads people to second guess their work, and is the most difficult part of the digital imaging experience for the vast majority of digital photographers.

The histogram is your key to interpret the quality of your captured images. While most users rely on the automatic exposure features of the camera, we will show you a tried and true technique for finding the perfect exposure.

When working with a digital camera you are essentially working with a very accurate light meter. Try this exercise:

- 1) Set your camera on a tripod in Manual Mode and set the metering mode to the center weighted metering mode
- 2) Place a Kodak 18% gray card on a white background, and photograph the scene under a consistent light source. Outdoors in daylight is ideal.
- 3) Using the camera's Aperture and Shutter speed dials to adjust the exposure until the camera's built in meter indicates "0" (this represents the ideal 18% value)



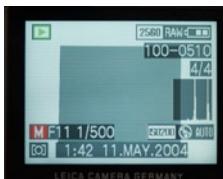
- 4) View the image histogram on the display

The image that appears should look something like the following picture. The histogram is telling us that the camera exposed the image slightly dark in an effort to balance out the white background. The peak in the histogram is shifted to the left of center. The Peak represents the 18% middle gray card.



Under Exposure

- 5) Adjust your exposure until the peak of the histogram is centered in the histogram window.



Ideal Exposure

- 6) Notice that the white board is now white, and the gray value is also lighter. In this example, the difference in exposure was one full stop.

- 7) Place the camera in automatic mode and select spot metering.

- 8) Make sure the gray card is in the center of the frame, and take a picture. You will notice that the histogram will look similar to the corrected histogram from the previous test. This verifies that the spot meter is well calibrated to the ideal 18% gray value.



Once you understand how the camera's built in meter operates, you may easily understand why automatic metering has its limitations in scenes where tones are predominantly light or dark. Experiment with using the various automatic metering modes using this same procedure to gain a better understanding of the exposure process.

As stated earlier in this guide, proper exposure is critical to high quality digital imaging, and will reduce the amount of time wasted in computer post-production and printing.

Color balance

Technically, digital cameras are color blind. In fact they potentially capture tones that are outside the human visible spectrum. In order to create accurate color several processes are necessary. The first step is neutral balance.

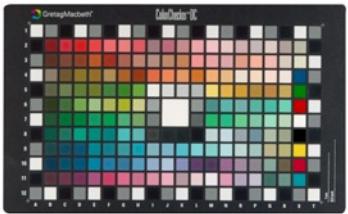
When we discussed bit depth and exposure earlier in this chapter, we talked in terms of density only. Since the sensor of the camera includes a matrix of red, green, and blue filters to build color, the resulting file ultimately ends up as three individual monochromatic layers exposed through primary color filters each with its own histogram. The colors do not naturally align in any way, and if you were to look at a pure raw capture file with no color balance it would appear teal or cyan in color.

When you select auto color balance, or any of the manual color balance settings in camera, you are artificially defining the neutral point (or white point) of the image. This is accomplished by shifting the image histogram data so that all three layers align at a fixed point in such a way that the defined point has no color bias.

When you perform a custom white balance, the camera simply uses the white point of your scene as opposed to a hypothetical pre-determined white point. When working with raw captures, you may manually alter the white point after capture as you are working with the entire set of captured data.

When shooting in JPEG mode your color decisions need to be accurate; the data is specifically processed to the chosen white point, and further post-capture adjustments will quickly degrade the image quality. If in doubt about color, it is best to capture several images, and discard the outtakes once you have a chance to review your work.

ICC color calibration



Just because we have defined an accurate neutral point in our image, this does not necessarily mean that colors may be reproduced correctly. As cameras, computer monitors, software applications, and printers may vary wildly from brand to brand and even within the same brands and models, there needs to be some definition of color from device to device.

Several years ago, the computer and printing industries got together and formed an independent committee to establish a method for describing color in a device independent process using color targets, spectral data capture, and a data structure that could be tagged to

an image file as a finger print or road map. This group was named the International Color Consortium (ICC) and the ongoing work of this industry group has made great strides to manage the communication of color through standardized methods generally categorized as ICC profiling, or ICC color managed workflow.

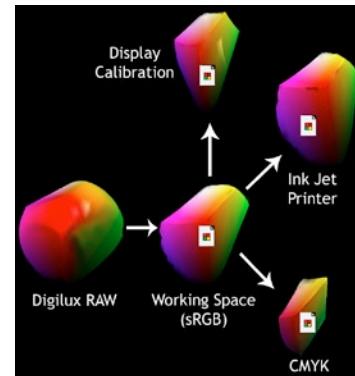
The basis of the ICC model is that all devices in the workflow need to be non-subjectively characterized via hardware measurement devices and reference color targets with known spectral values. When an ICC profile is created the differences between the actual and measured digital values are compared. The color shifts are measured, and stored so other devices in the process may properly interpret the data to produce accurate color.

If you are using any modern computer system and application software, you are using color management by default. In the Apple® OSX operating system, color management is tightly integrated at the core of the system using Apple®'s ColorSync™ technology which is ICC based.

The ICC workflow model

In the ICC workflow the camera or scanner has an input ICC profile, your display has a unique ICC profile, and any or all of your printers have a unique profile as well. When you open an image in Adobe® Photoshop™ (or any other ICC aware application) the software translates the color of the file to your working space (which is usually an RGB working space-such as sRGB) transparently in the background, the colors from your camera are adjusted to properly display on your monitor. When you print an image, the colors are converted to the unique fingerprint of your printer. Later in this guide we illustrate how to print on an Epson® 2200 printer.

The diagram below illustrates the process that takes place when you open, view and print an image in Adobe® Photoshop™.



As we stated earlier, when you are working with the Digilux 2 in JPEG mode your files are automatically delivered in the sRGB color space which has become a widely adopted baseline description of color in the computer industry.

If you are interested in creating a custom ICC profile for your camera, you would need to shoot a properly exposed image of a digital camera color chart, and open the image in the Adobe® Camera Raw™ or LaserSoft® SilverFast™ software with no custom settings applied. Using profiling software tools such as the Eye One™ system from Gretag Macbeth® you can create a custom camera profile. This profile can be manually applied to images as they are opened. The Digilux 2 camera does not support embedding custom profiles at capture.

Calibrating your display



The single most important thing you may do as a user is to purchase a monitor calibration device such as the Eye One Monitor™ from Gretag Macbeth®, or the Monitor Spyder™ from ColorVision®, or the Monaco® Optix™ display calibrator system. We suggest calibrating your display to 6500k and 1.8 gamma. These settings are options in all of the mentioned products.

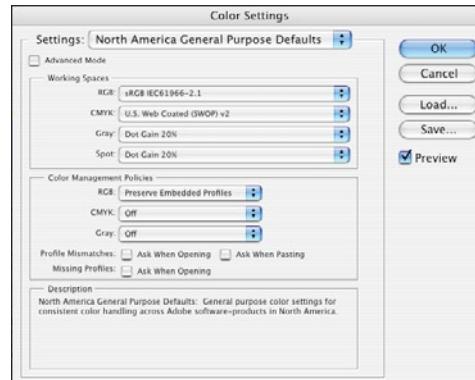
Defining your working color space

The second most important factor in your workflow is defining your working RGB Color space in all of your editing applications. Since color management is based almost entirely on input to output relationships, the path needs to be free of unnecessary color transformations.

By default Adobe® Photoshop™ is set to sRGB. Using these default settings if Adobe® Photoshop™ encounters an image that has a color profile other than sRGB it will honor the embedded profile. Please check to see that your Photoshop™ color preferences are set as pictured below.

If you change your working space in Photoshop™ keep in mind that all other applications that support ICC profiling should be set to the same working space for RGB images so color is not inadvertently transformed. While larger color spaces are preferable for certain higher level applications, the fact is that the Digitus 2 camera

was not specifically designed to meet the needs of this sector of the photographic marketplace. The following screenshot represents the default color settings of Adobe® Photoshop™ CS. If you do use a larger working color space on your computer, simply allow Photoshop™ to convert the color from sRGB to your defined working space.

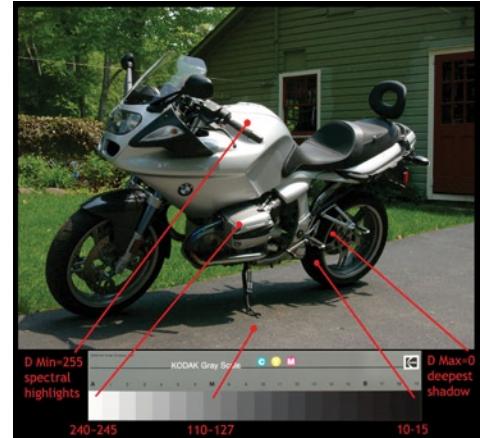


Evaluating your digital images

When evaluating your images always look at tonal values first. Beginning with the shadows of the image, look for clues to tonal accuracy. For example:

In the following image, the shadow inside the rear wheel is pure black. We may assume this is our D Max point. The values should read 0 to 5 points.

The pavement in the sunlight is a good indication of neutral exposure values. On a sunny day, expect a value of 110-to-127 and a neutral color balance (near equal RGB values).



The white areas with detail should have a value of 240 to 245. This is a critical value to keep track of since once a white with detail is overexposed there is no way to get the information back. A raw file format image will be more forgiving, but this is not a good practice.

The spectral highlight on the gas tank will read an RGB value of 255 255 255 this means that this is the absolute whitest part of the image. There is no usable information in this area, and if printed these areas will have no density.

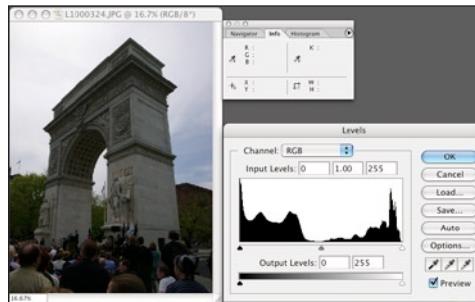
Overall this JPEG image file is technically exposed properly, but given that the motorcycle was photographed in direct sunlight, the silver gas tank is slightly overexposed. While some adjustments could be made on the computer, the best correction to this problem would be to reposition the motorcycle to avoid the direct sunlight.

Editing suggestions (Adobe® Photoshop™ CS)

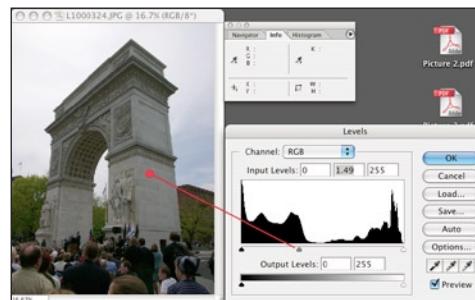


If an image is poorly exposed and does not have a pleasing tonal balance, work methodically from the shadow point up through the mid-tone and highlight areas. Your first corrections should be to the levels adjustment in the shadow area. Using the RGB readouts in the Info dialog adjust the black point to read values in the 5-15 range on average, Next adjust the mid tone values to the 110-127 range, and the highlight (if there is a bright white value in your image) to a value of 240 to 245.

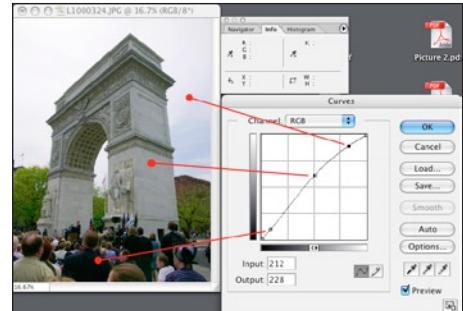
Think in terms of a 21 step Kodak Gray scale as highlighted earlier in this chapter. Tonal adjustments to your images may be directly correlated to this target to give you a road map to follow as you edit an image.



In this particular example, the camera was aimed towards the sun on a hazy day. The cameras meter biased exposure to the sky causing the intended subject to become underexposed. Using the tonal values (not color) as a guide, the mid-tone was first adjusted in the Levels dialog. It is always best to perform your initial tonal adjustments in the Levels dialog. The mid tone was lightened to a value of approximately 115.



After the Levels adjustments, the Curves dialog is used to fine tune the tonal balance of the image.



In the curves dialog you may identify and alter specific points, and alter the tonal distribution. In this case, the dark suit in the foreground was mapped to a value of 15, the monument was mapped to a value of 140 (as it is lighter than 18% gray), and the sky was mapped to a value of 240 to retain some detail. This method of image editing is rooted in the traditional zone system of photography.

Note:
When editing JPEG images
It is very important to
save your edited version
of the file as a copy of the
original file as the editing
process is destructive.



Archival printing using the Epson® 2200 printer



Many digital photographers become frustrated when it comes to achieving high quality print output from their computer workstations. To help with this situation we have outlined a step-by-step guide for creating high quality prints using the popular Epson® 2200 Ink Jet Printer. This printer utilizes

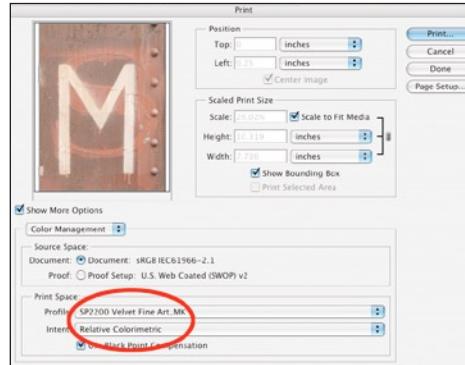
high longevity pigment based inks, and is perfectly suited for the Digilux 2 camera user. The instructions are based on Adobe® Photoshop™ CS and the Apple® Power Macintosh™ computer running under Mac OS X (version 10.3.3)

Once you have opened, and edited an image to your liking on your calibrated display, and are ready to print from within Adobe® Photoshop™ CS follow these steps:

- Choose Page Setup from the File menu and check that the Epson® 2200 is chosen, and select the paper size you wish to use.



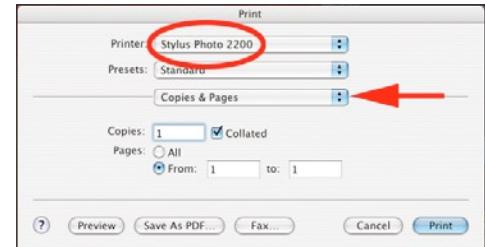
- Choose "Print with Preview" from the File menu, and select the paper profile from the "print space" menu for the ink and paper currently loaded in your printer. In the example below, Epson®'s default profile for Velvet Fine Art Paper and Matte Black Ink has been selected.



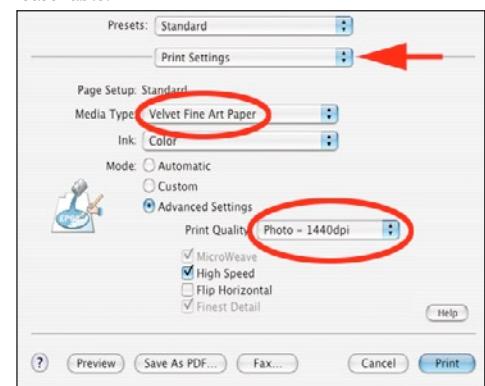
Note: The 2200 prints best on matte surface media the matte black ink cartridge installed. You may also check "Scale to Fit Media" to avoid problems with sizing.

- Clicking on the "Print" button in the Photoshop™ "Print with Preview" panel will take you to the Epson® print dialog. The settings of the Epson® print dialog are critical to making a successful print.

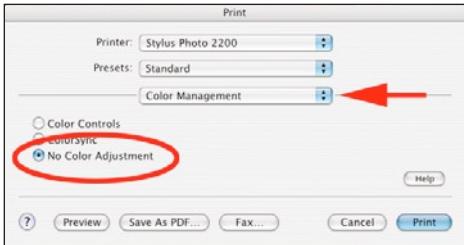
- In the Epson® Print dialog the first step is to verify that the printer you selected in the "Page Setup" dialog exactly matches. Under the drop down menu marked "Copies and Pages" you will need to select and configure specific print options to achieve a successful print.



•Under "Print Settings" select your paper type, and under "Advanced Settings" mode, select your print DPI. 1440 is excellent for all round work as it produces excellent print sharpness while keeping print times reasonable.



- Under "Color Management" choose "No Color Adjustment". While this does not sound logical at first, keep in mind that the color transformation has already taken place within Photoshop™ via the selected Paper/Ink profile. By choosing No Color Adjustment, you will ensure that the color transformation is not applied twice.



Note: We suggest trying the Velvet Fine Art paper to get started. Once you are comfortable with the process, you may visit the Epson® web site for additional paper, color profiles and further instructions.

Whatever paper you choose to print on, always make sure that the paper profile, and the paper type are correctly matched. Most Epson® and third party ink jet media include directions for the appropriate paper type settings. Experiment with several types of paper and settle on two types to keep your output predictable.

The Digilux 2 is capable of producing excellent image quality when combined with a high quality printer like the Epson® 2200 and the instructions outlined in this overview.



The wide tonal range of the Epson® 2200 printer combined with the high resolving power of the Leica Digilux 2 is a powerful combination.

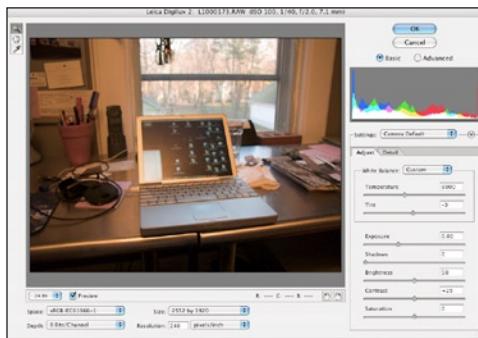


Chapter Four

Working with Raw Image Files

Software tools for editing your raw image files

There are two ways to open and edit your Digilux 2 raw files. Adobe® Photoshop™ CS incorporates a plug-in called Adobe® Camera Raw™. This software interprets the image data, and allows you to make a wide range of image adjustments not possible with the JPEG file format. The second approach is to open the raw files in LaserSoft® SilverFast™ DCSE which comes bundled with the Digilux 2 camera. While both solutions work quite well, we feel that the Adobe® Camera Raw™ is the cleanest path to creating successful edits. Silverfast™ DCSE on the other hand, has several unique tools that make it attractive for certain specific tasks, and of course as a bundled application, it is free to use for Leica Digilux 2 owners.



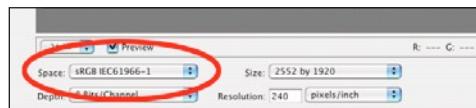
Editing raw image files using Adobe® Camera Raw™

Before you begin working with raw files, you will need to make sure that you have the latest version of Adobe® Camera Raw™ installed in your computer. The updates are available on the Adobe® web site. Versions earlier than 2.1 of this software will not recognize the Digilux 2 raw file format. Follow the instructions on the

Adobe® website for installing this software.

Once you have installed Adobe® Camera Raw™ software, you may double click on a raw file, or drag it over the Photoshop™ application icon to open the file. As the file opens, the Camera Raw™ application will intercept the file, and present you with an editing dialog. The Camera Raw™ interface is very straightforward, but at the same time it offers a wide range of adjustable parameters. A key feature is the ability to save one or all of your adjustments as presets for future images. Using these presets, you may customize the tools to liking for various photographic situations. We have outlined the basic steps to configure and save a preset for the Digilux 2. You may use the instructions as a jumping off point for your own custom edits.

Color Space



Color Space refers to a pre-defined definition of the palette of colors available for the processed digital image file. As the raw image file contains uninterpreted image data, the captured colors are undefined, and in many cases contain colors outside of the human visible spectrum. When you choose a particular color space, you are essentially giving the captured data a "road map" to predictably process the color information. You will notice a list of color spaces under the "Space" option on the lower left of the Camera Raw™ interface window.

The four options are:

sRGB IEC61966-1 (2.2 Gamma)

The default color space for most digital cameras and printers. It was engineered to give pleasing results across a wide range of input, display and output devices. sRGB is also the default color space of the Digilux 2 when in JPEG file format mode.

ProPhoto RGB (1.8Gamma)

Developed by Kodak to provide an idealized wide gamut space that would preserve the maximum range of colors while retaining compatibility with calibrated display and output devices

ColorMatch RGB (1.8Gamma)

The color gamut and tonal balance of ColorMatch RGB were engineered to fall into line with legacy Pre press viewing and proofing standards

Adobe® RGB (1998) (2.2 Gamma)

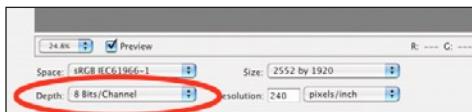
Adobe® RGB (formerly SMPTE 240m) is a monitor-based color space that is larger than sRGB, and is a good choice for more advanced imaging and printing.

For the purpose of this guide, we will adhere to the sRGB Color Space as it is the default setting for Adobe® Photoshop™.

Note:

When changing your color space settings, you need to configure all of your editing applications to the same parameters. For example: if you wish to work in Adobe® RGB (1998) You will need to choose this space in the Photoshop™ color dialog, and choose this setting when importing raw files using the Camera Raw™ Plug-in.

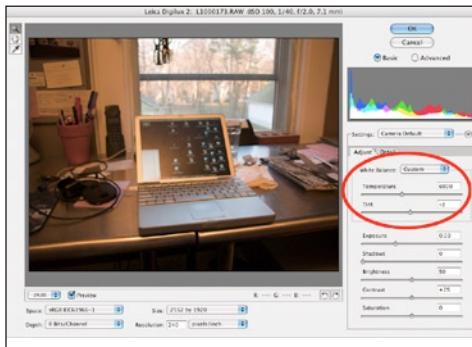
Bit Depth



The bit depth option gives you the ability to process images to 8 or 16 bits per pixel. We suggest using 16bits per pixel when importing your raw image files. By selecting 16 bits per pixel, you will retain the ability to edit all 16,500 tonal gradations as opposed to the 256 tonal gradations available in the 8bit per pixel option.

Adjustment Tab Controls

White Balance

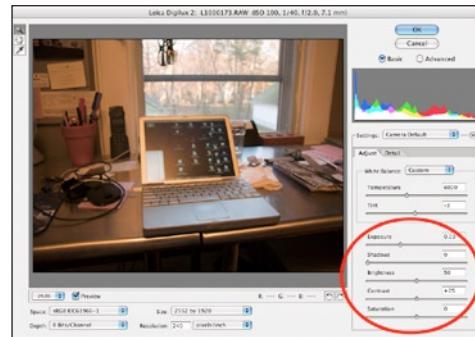


The white balance function is somewhat self-explanatory in that you may drag the "temperature" slider to compensate for mixed lighting conditions.

Enter a desired color temperature look, or drag the slider to interactively control the color and tint. While some image editing software tools offer the ability to force a selected point to become neutral, the Adobe® Camera Raw™ plug in does not include this function. To make the best use of this tool, the goal is to achieve the most natural color balance for the predominant subject in your image.

The example image on this page is typical of a mixed light situation. The color balance has been adjusted to make the laptop appear close to it's natural aluminum color. When using the white balance tool, small adjustments will dramatically alter the image, so keep your adjustments to the minimum.

Exposure



This slider adjusts the entire range of tones in the image to a lighter or darker value. There is no direct correlation to photographic f/stops, but you may refer to the RGB value readouts to gauge the effect of your tonal adjustments.

Shadows

This slider adjusts the value of the exported black point. The numeric value under the slider does not represent any specific photographic value, but you will notice that adjusting the slider to the far left will reveal detail (and usually noise) in the shadows for your image. Moving the slider to the right will "clip" the black tones of the image to absolute black. This tool is extremely useful for fine tuning the tonal weight if your image is for high quality reproduction.

Brightness

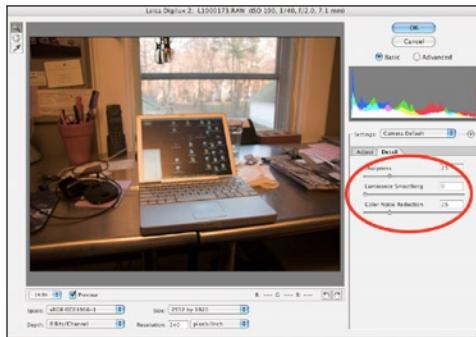
The word brightness is misleading in the sense that this slider is actually affecting the mid-tone density while retaining the shadow and highlight values of the image. Traditionally this adjustment is referred to as Gamma. This is one of the most useful tools you may use to fine tune the tonality of your image.

Contrast

This adjustment acts upon the tones falling in the highlight and shadow areas by compressing or expanding the information. Use this control sparingly, as you will have more subtle control by using a combination of the Exposure, Brightness, and Shadow controls.

Saturation

The saturation slider enhances colors in the image. Use this tool sparingly, and only after making adjustments to density and contrast. Adding too much saturation in this tool will result in images that may look bold on screen, but will be difficult to print.



Detail Tab Controls

While JPEG files are sharpened in-camera as they are processed, raw files are unsharpened. Working with unsharpened raw files takes some testing to find the best mix of settings. Under-exposed scenes and night shots will inherently have more digital noise, and will begin to break up if too much sharpening is applied. Outdoor images, and lighter scenes may be sharpened more aggressively.

Sharpness

The Sharpness slider has a range of 0 to 100 with a default setting of 50. These numbers mean nothing other than the relative amount of pixel sharpening that is applied. 0 represents no sharpening, and 100 represents maximum sharpening.

Luminance Smoothing

The red, green and blue values of a digital file are seen by the computer as three gray scale layers of tonal information.

As the cameras sensor captures images through a matrix of color filters, the resulting gray scale layers of the image contain missing information. When sharpening is applied, this missing information is enhanced. Luminance smoothing slightly blurs and smooths out the individual tonal transitions while retaining color values. Use this adjustment sparingly, as the image may end up looking unnaturally soft.

Color Noise Reduction

As you sharpen images created with single shot CCD sensors, you begin to see the effects of the color filter matrix and the effects of the mathematical algorithm used to process the captured data. The digital artifacts are enhanced and appear as magenta and green speckles. This slider will seek out the color-saturated anomalies, and will de-saturate them resulting in a smoother, more photographic image.

Storing and Applying Settings across multiple Images

Obviously with all of these controls, the process of editing raw files can be quite daunting. The good news is that you may save any or all of these settings as you find parameters that work consistently for your images.

Settings (saving)

Once you have arrived at the combination of settings you wish to apply to future images, you may save the settings by clicking on the arrow button adjacent to the Settings pop up dialog. Clicking this button will give you the choice of the following options:

Load Settings- Loads previously saved settings

Save Settings- Saves new presets. When selected you will be prompted to give the settings a name.

Set Camera Default- This option saves all current parameters as a camera default. As images from the same camera type are opened, you could select Camera Default from the settings menu to apply the same settings to any number of images. It is a good idea to save the settings as a backup with a meaningful name, as if the application becomes corrupted, you will lose your default settings.

Reset Camera Default- This option clears all adjustments and restores an image to the parameters used at capture. This is an important setting to be aware of, as you may easily create presets that will degrade image quality. This is your option to start from scratch.

Editing images using Lasersoft® Silverfast™ DCSE

If you do not have Adobe® Photoshop™ CS and wish to edit your raw image files, Leica has bundled a very powerful tool from Lasersoft Imaging. While the interface is quite different than what you may be used to, Silverfast is an extremely powerful tool, and is part of a family of software modules that may be used with a wide range of scanners and cameras from different manufacturers. Once you learn about the capabilities of SilverFast, you may upgrade to the full version of SilverFast™ DC Pro for even more control.

Silverfast™ has some distinct advantages over using the Camera Raw™ plug-in especially in the areas of toning and image neutralization. We will focus on these key features to help get you started with the application. We suggest that you explore using this bundled application as you will find in certain circumstances it will be indispensable.

Setting up Silverfast DCSE

After installing and registering the application, there are some initial settings to be aware of before you set out to edit your first image file.

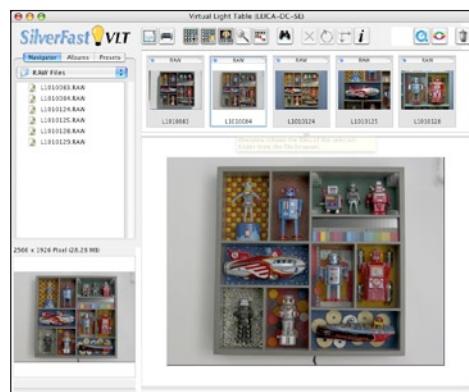
Launch Silverfast™ by clicking the Silverfast™ icon in the dock. You will be presented with the following dialog:



Choose the "Open Automatically" check box and click "Start" to launch the application. When you first open the application, you will be presented with a light table view of your image folder. Unlike Apple®'s iPhoto™ or the ACD™ browser applications, Silverfast™ will read your Digilux raw files, and will create preview icons automatically.

Selecting your raw image folder

Earlier in this guide we suggested creating a folder in your user->pictures folder named raw files. Using the navigator button on the upper left of the light table window, you may browse your computer's hard drive to locate your own raw file folder. When you select the folder containing your raw image files, Silverfast will show a thumbnail view of all of your images. You may also access raw files directly from a connected camera or an SD card via an external card reader.



Opening an image to edit

The easiest way to open an image from the light table view is to double click on an image. This will automatically bring up the editing window.

About Silverfast

Some of the features in Silverfast are similar to the Adobe® Camera Raw™ software tools. In this overview, we will highlight the specific tools that could be used to improve an image. While the software has many more features, we feel that this overview will give you a working understanding of a typical editing session.

Scan Pilot

Scan Pilot is a tool that is supposed to help you walk through the editing process. We suggest that you click on the "Prefs" button and unclick the "Open at Startup" selection, and close the Scan Pilot window.

Evaluating an image

Before touching any editing tools, you should learn to evaluate an image. While most people today work with color images, it is important to think of all images in terms of tonal gradation.

In traditional film-based imaging, several key factors directly influenced the final quality of an image. D Max refers to the most dense area of an image, and D Min. is the lightest tonal point in an image. The Gamma slope of an image or "curve" relates to how tones are distributed between black and white. Traditionally, the Gamma for transmissive materials is 2.2, and the Gamma for reflective subjects is 1.8. While digital imaging seems complex to most people making the transition, these tried and true photographic principles still remain as important as ever.

When you capture, create, or scan an image into a computer, you are directly involved with tonal decisions, and your adjustments may make or break an image with equal ease. When people processed film they adhered to very exacting processing times, and temperatures to achieve high quality. With digital imaging, the same people will engage in guesswork that only leads to a frustrating experience. When evaluating or editing a digital image take a methodical approach.

For example:

The darkest area of an image has a numeric value (D Max.) represented as a value of zero (0) The lightest area of your image has a numeric value (D Min.) represented as a value of 255. As a general rule, it is safe to retain some values in the highlight and shadow of an image such as a value of 5-15 in the shadow, and a value of 240-245 in the highlight. If you were to photograph a properly exposed 18% gray card, the value would be approximately 127 (in a 1.8 Gamma configuration and 110 in a 2.2 Gamma environment)

If you look at the individual red, green, and blue values of the same 18% gray card, you will note that the values are equal (red 127, green 127, blue 127). This indicates that the area has absolutely no color bias, and is neutral balanced.

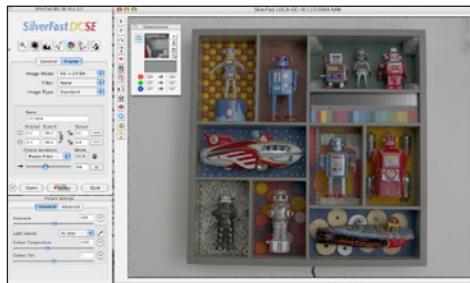
D Max=	Middle Gray=	D Min=
Red 0	Red 127	Red 255
Green 0	Green 127	Green 255
Blue 0	Blue 127	Blue 255

With these markers in mind, you may begin to properly interpret any image. Let's look at a typical editing session. Many of these same tasks may be performed in any image editing software.

Example Silverfast Editing Session

Open an image in Silverfast

Make note of the numeric values in the densitometer as you move the cursor through your image.



Evaluate the shadow point

Find the darkest value in the image. Are the values close to zero? Are the values very different between the individual RGB readouts? Look for values that are between 5 and 15. Pressing the Control+Option keys will find the darkest pixel in the image.

Evaluate the highlight point

Find the lightest value in the image. Are the values close to 255? Are the values very different between the individual RGB readouts? Look for values between 240 to 250. Pressing the Shift+Command Keys will find the lightest pixel in the image.

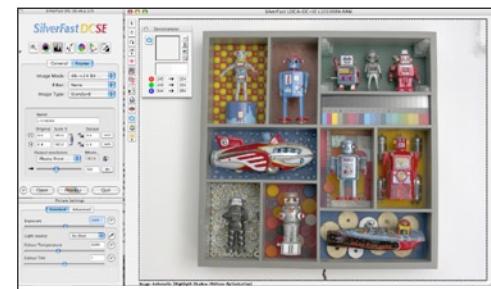
Note: In this sample image, the gray scale is not valuable for density adjustment due to the lighting conditions at capture (outdoor open shade). The scale may still be used to verify color balance.

Image auto-adjustment



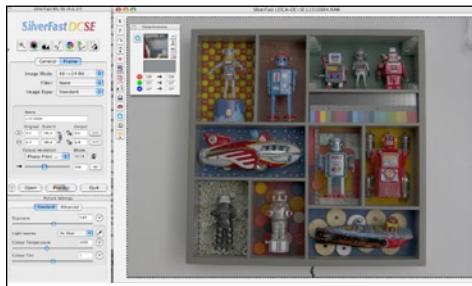
There are several methods of adjusting shadows in Silverfast. The quickest method is to select the Automatic Highlight-Shadow-Midtone adjustment button.

This tool analyzes the image by locating the brightest and darkest pixel within the frame selection, then establishes a proper mid tone value. This adjustment will also remove any color casts in the image to ensure that your blacks and whites remain neutral. By cropping into specific areas of an image, you may leverage this automatic adjustment process to quickly correct difficult images.



Note: If you wish to adjust density only while retaining the existing color cast of the image, hold the shift key while clicking on the Automatic adjustment button. The tones will be adjusted, but color balance will be maintained.

Manually editing an image in SilverFast™ DCSE



After evaluating this image we know that the front of the boat in the lower right is the darkest point, we also know that this boat is pure black. Generally when editing, we would want this area to have only a few values to retain some future editing flexibility. We also know that the color values need to be equal in order to insure that our digital prints do not have any color casts in the shadows. Lets shoot for RGB values of 5-5-5.

The quickest way to edit an image is to begin with the shadow point, and work methodically up the tonal scale to the whitest point making decisions along the way based on the cumulative results of each adjustment. If you make a mistake, you may always undo the last step by pressing Command-Z.

SilverFast incorporates many tools that may be used to fine tune an image. Each tool offers automatic as well as manual controls allowing you the freedom to experiment with several editing approaches. This flexibility is what makes SilverFast such a powerful image editing tool.



Shadow adjustments

To automatically adjust the shadow point of your image. Click once on the black triangle and then select the darkest point in your image. The selected shadow point will be adjusted to an RGB value of 5,5,5.

Highlight adjustments

To automatically adjust the highlight point of your image. Click once on the white triangle and then select the lightest point in your image. The selected shadow point will be adjusted to an RGB value of 249,249,249.

Note: If you wish to adjust density only while retaining the existing color cast of the image, hold the Shift key while clicking on the Automatic adjustment button.

The tones will be adjusted, but color balance will be maintained.

Image before and after manual shadow-highlight-midtone adjustments.



Mid tone Balance adjustment

Between the black and white triangles on the icon, you will see an eyedropper tool. This tool allows you to pick a neutral point in the image. Click once on the eyedropper, then click any area of the image that you wish to be neutral of color. This tool does not alter density, but is extremely useful to improve the color balance of your images.



Manual Level and Curve adjustments

Often times the application of automatic image adjustments will over-enhance an image. Silverfast™ has the ability to fine tune the image density via an interactive levels dialog. Clicking on the Levels icon will reflect the effect of the automatic highlight-shadow adjustments. Clicking on the Curves icon will reflect the effect of the automatic highlight-shadow adjustment. The individual tools in SilverFast™ inter-operate to give you multiple options for making image adjustments. Using the automatic settings as a guide, you may alter Levels and Curves values to improve image quality.

Levels and curves adjustments are essential to any image editing session. Gaining an understanding of the operation of these tools will allow you to quickly fine tune images for high quality reproduction. The following section will review the process of editing levels and curves as well as the key features of SilverFast™ DCSE

Level adjustments

If the automatic adjustment resulted in an overly dark image, you may click on the left (black) triangle and drag it to the left until you reach the desired shadow value. The same adjustments may be made to the highlight and mid-tone values. Moving the white triangle to the right will increase highlight density, and moving the gray mid-tone triangle to the left will lighten the mid-tones, moving the slider to the right will make the mid-tones darker.

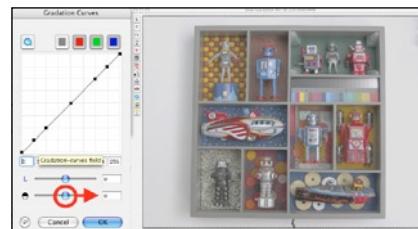


By dragging the Highlight, Shadow, and Mid-tone adjustment sliders, you may adjust the overall density of an image. In this example, the shadow point was moved to the left to allow more tone in the shadows, and the highlight point was moved to the right to allow more tone in the highlights.



Curve adjustments

The Curve adjustment dialog alters tones that fall between the darkest and lightest points of the image. Begin by adjusting the contrast slider to add or reduce overall contrast. You may then make minor adjustments to specific areas of the curve to tone the image. When adjusting curves, make small changes and evaluate the image as you go. Avoid creating curves that move in too many directions as this will quickly degrade your image data.



Start by sliding the Contrast slider to the right to add contrast, and to the left to decrease contrast. The curve may be fine-tuned by clicking and dragging specific points on the tone curve or by entering numeric values. We suggest adjusting levels first, then use curves to fine tune your images.



Global color correction

Using the Global Color Correction tool, you may alter the overall color balance of an image using an interactive hue wheel interface. Simply click and drag the slider until the desired color balance is achieved.



The slider above the "OK" button allows you to modify the intensity of the effect. If you wish to reset to where you started, click on the reverse arrow button on the lower left of the window.

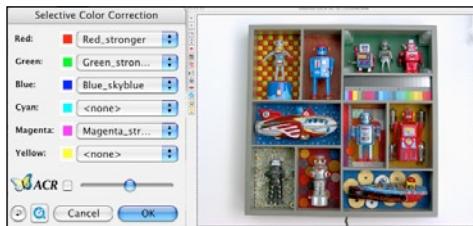


Note:

If you are not using a properly calibrated display and printer, these subjective adjustments may not reproduce faithfully on output. The Global Color Correction tool is best for creative effects as opposed to color accurate imaging.

Selective color correction

Often times, you will want to alter the relationships between colors, or the balance of specific colors in an image. Selective Color Correction is the tool in Silverfast™ to perform these tasks. The easy to use interface simply offers you pull down menu items for each color family. Selecting the various options will allow you to quickly make the sky a darker blue, or a skin tone warmer while leaving other colors untouched.

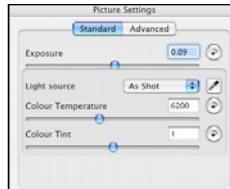


Note:

SilverFast™ DCSE is a version of a more fully featured application called SilverFast™ DC PRO. This program offers even more control of selective color including an interactive color wheel interface, and the ability to alter the individual hue saturation and lightness for each color. Visit <http://www.silvefast.com> for more information.

Picture Settings

Silverfast™ DCSE incorporates multiple methods to accomplish the same tasks. For example, we have identified several ways to perform color adjustments to an image in this section. As the development of SilverFast™ began in the world of film scanning, new features have been added to assist editing direct digital captures. While these tasks could be accomplished using the more traditional tools such as levels, endpoints, and curves, in many ways the digital image controls are faster and less subjective.

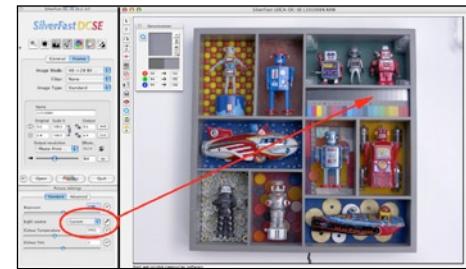


Exposure

When opening raw file format images, the exposure tool has full access to the entire 12 bit capture bit depth. It is possible to improve images that were inadvertently under- or over-exposed.

Light Source

The most useful feature in the Picture Settings dialog is the Light Source tool. In the drop down menu, you will see multiple light source options and a custom option. If you choose Custom, and then click on the eyedropper tool, your cursor will change to a gray triangle when it is positioned over your image. Select an area in your image that is neutral in tone, and the software will force the point to become neutral. The Color Temperature readout will reflect the actual color temperature.



Clicking on a known neutral area in your scene will create a custom color temperature (white balance).

Color Temperature

If your color as captured is not satisfactory, and your image does not include a neutral area to assist in creating a custom adjustment, you may slide the color temperature slider, or enter the approximate color temperature of the lights your subject was illuminated with during capture.

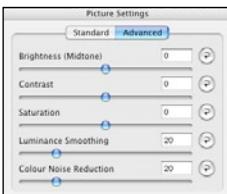
For example:

If your scene was illuminated using tungsten lighting try setting the color temperature to 3200k.

Color Tint

Used primarily as a creative control, the color tint slider simply biases the Hue of the entire file. This is the equivalent of a color correction gel in traditional photography. However, there is no numeric equivalent to traditional photographic filtration. When using this feature, we suggest testing several images.

Advanced Picture Settings



Brightness (mid-tone)

Adjusting the mid-tone brightness is essentially a Gamma adjustment. In other words, moving this slider changes the lightness of the mid-tone in relation to the highlight and shadow points. Using this tool is the equivalent of moving the mid-tone slider in the Levels dialog mentioned earlier in this section. You will notice that when you change this slider, the Levels dialog will become highlighted.

Saturation

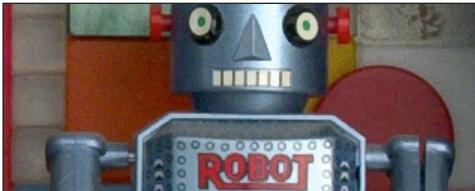
Moving the slider to the right increases color saturation, to the left decreases color saturation. This is a subjective adjustment.

Luminance Smoothing (default=20)

Luminance smoothing alters the processing algorithm to reduce noise which appears as grain in the Luminance (density information) of an image. A lower setting (0) applies no smoothing, and appears grainier especially in the shadows. A higher setting (100) applies maximum smoothing, and will tend to distort information by over-averaging. The default setting is 20 and is effective for most applications. There are many variables across a collection of digital images, so we suggest testing before applying any changes.

Luminance Smoothing example:

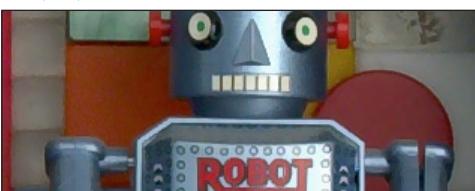
0 (None)



20 (Default)



100 (Full)



Color Noise Reduction (default=20)

Is similar to Luminance Smoothing in that it alters the processing algorithm to reduce noise. The primary difference is that this process specifically alters pixels with color value anomalies. These anomalies occur due to the color matrix on the CCD itself.

In certain circumstances where the subject matter contains high frequency repetitive patterns such as hair, text, window screens, and textiles undesirable artifacts may occur. These artifacts are often referred to as color moire patterns. A lower setting (0) applies no smoothing, and will show the most color artifacts. A higher setting (100) applies maximum smoothing, and will tend to desaturate colors in certain areas.

Color Noise Reduction sample:

0 (None)



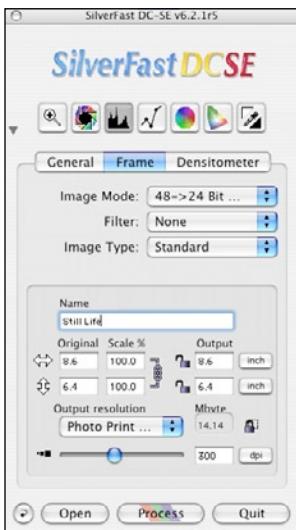
20 (Default)



100 (Full)



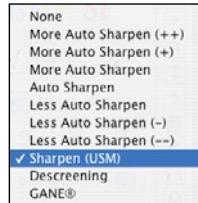
Sharpening and Scaling in Silverfast



Once you have edited an image, there are a few optional steps to take before your image file is ready to be processed. Silverfast can apply image sharpening and perform image scaling to optimize the file for specific output devices.

Sharpening

Image Sharpening settings are chosen under the Filter popup menu under the Frame tab on the main SilverFast™ window. If "None" is selected the file will not be altered. If "Sharpen USM" is selected you will be presented with an interactive sharpening dialog.



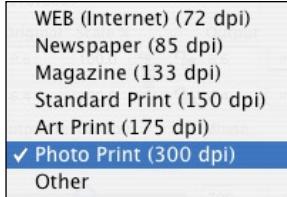
Note:
Preset sharpening settings may be selected or custom settings may be previewed and applied. If uncertain, check Auto Sharpen.

Descreening is useful when copying half toned artwork.

Customizing sharpening settings

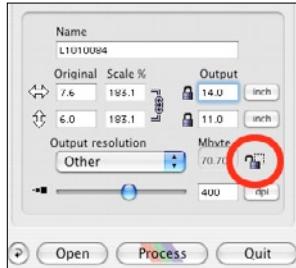
Click on the Preview button in the Sharpen dialog, then click anywhere in your image; the software will present a preview of the final file with the current settings. Adjust the intensity for the desired level of sharpening. Confirm by checking several areas.

Scaling for output



Under the Output Resolution popup menu, you will be presented with a list of preset output resolutions. For most applications we prefer to leave the settings at the default "Photo Print (300DPI)", but if you are interested only in web graphics, choosing "WEB (Internet) (72DPI)" setting will reduce the resolution for faster performance.

If you would like to scan to a specific output size, unclick the lock icon over the DPI dialog and the locks next to the output resolution entry fields, and enter the desired output size. Click the entry field locks, but leave the DPI lock unlocked. As you crop your image you will notice that the software will automatically keep the proper aspect ratio and resolution. When finished, enter a filename, and click Process to save your file.



Chapter Five

Creative Techniques

Night/Low Light Photography



Many digital cameras perform poorly in low light situations. The Digilux 2 performs quite well in low light, and opens up a wide range of creative opportunities. Shooting at night presents a number of technical challenges that require you to plan your approach to ensure that your efforts are rewarded with the best possible digital image files.

When photographing in low light, you will get surprisingly decent images using the camera in full automatic mode, but the real fun begins when you take control of the camera in manual mode where you may define the color, exposure time, and aperture. Before you set out to begin photographing at night, we suggest that you bring along a few items.

Remote release cable

Lightweight tripod

High capacity memory card (to store raw image files)

Technical Note:

When creating night shots, we suggest that you capture in the raw format. While this will slow down your capture process, and consume quite a bit of storage space, you will benefit from having full access to the captured image data when you edit your image on the computer. For example: when you shoot in any of the JPEG image modes, your image data is processed according to the color/exposure set at the time of capture. In addition, color data is constrained to the sRGB color definition which clips information, and the image degradation of the JPEG compression will add additional noise and distortions.

Why raw mode?

While under most circumstances the in-camera conversion to the JPEG file format is more than adequate, night shots push a digital camera (as well as traditional film) to the limit. If you open a Jpeg file of a night shot and make even small adjustments to levels, curves or color balance, you will quickly see the image degrade. Any noise (grain) in the shadows will be exaggerated, and color banding (uneven gradations) will be more prevalent. The reason for this loss of quality is due to the fact that while the camera sensor initially captures 12bits per pixel (4096 individual gradations per color), the in-camera JPEG processing re-maps tones down to 8bits per pixel (just 256 individual gradations). In addition, JPEG compression creates artifacts that further degrade the image quality. If you shoot a JPEG image and decided after the fact to shift the color balance from daylight to tungsten, you will be throwing away an additional 25% of your already limited tones. The raw image file is processed and stored directly from the image sensor to your memory card. When opening the image into your editing application, the software has full access to this original data. Large moves of color and density may be applied to derive the best possible

image. In practical use, you will learn to carefully choose the situations where you want to shoot once and edit many times.

Quick Tip:

Since shooting in raw format is slower and consumes valuable storage space, You may switch to a JPEG mode while composing your image, to experiment with settings and composition. Once you arrive at the settings you wish to use, you may switch back to raw mode for your final capture using the function button.



Basic Night Shots



- Set up your camera on a tripod, and compose your image, plug in the remote release cable. If you do not have a remote release cable, you may set the camera to self timer mode. Choose two seconds which will allow the camera to settle on the tripod prior to taking the picture.
- Set the camera to daylight color balance using the function button and the selector arrows. This will result in a pleasing warm tone for street lamps and car headlights etc.
- In automatic mode take a test image, and using the quick review feature, check the resulting image. Look at the color balance, exposure, and overall image sharpness.
- If the resulting image looks acceptable, set the camera to raw file format and take a second image. This will allow you more flexibility for editing down the road.

Advanced Night/Low Light Shots

With the previous steps as a starting point, you may wish to set the camera to Manual mode to dramatically alter the scene.

- Switch the shutter speed dial to 2+ and set the aperture to Automatic
- Set the White Balance to Daylight
- Using the selector dial for shutter speeds, take a series of images ranging from 1/2 second to 8 seconds. As the aperture is in automatic, your exposures should be fairly consistent. If you wish, you may switch to manual aperture for even more control.
- When using manual aperture, you may select the image histogram view to evaluate your exposures by pressing the display button until the histogram appears. The data points should be distributed evenly between the shadow (left) and highlight (right). You will notice that the histogram will change color as an image becomes grossly under or over exposed.



Variations of aperture and shutter speed will dramatically alter the mood of your night and low light photography. When used in combination with the built-in flash, the possibilities are endless.

Sports Photography



At first glance, the Digilux 2 does not appear to be a camera well suited to sports/action photography. As we set out to create this guide, we quickly discovered that the short shutter delay, fast auto focus, and optical performance all contribute towards the ability to capture very well defined images of even the most fleeting moments.

Based on these experiences, we have outlined some effective baseline settings to help you get started. With these starting points as a guide, you may experiment with your own configurations as the possibilities are almost endless.

Basic sports photography

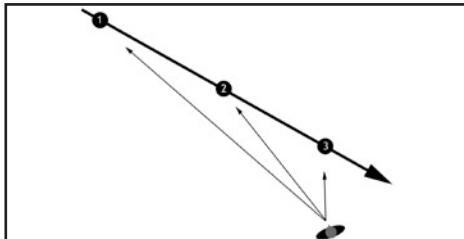
When creating images of sports, the option of using the raw file format while possible, is not preferable due to the increased storage times between captures. This makes your initial camera settings critical as those settings will be permanently processed into the resulting JPEG image files.

- Set the camera to JPEG mode, best quality
- Set the Shutter Speed dial to a 1/500th to 1/2000th of a second
- Set the Aperture ring to the A position.
- Set the Focus ring to the AF position

Composition tips:

When composing your subject, practice filling the frame by zooming in as far as possible. This serves two practical functions: you will be using the full resolving power of the camera's sensor, and you'll be able to zoom out as your subject comes closer to the camera. Try to keep the subject centered in the frame as you follow the action so the auto focus will have a higher probability of tracking the subject.

When shooting fast moving subjects, it is easier to photograph the action coming towards the camera, than it is to capture subjects passing across the field of view. While you may pan along with the action, your chances of catching the action will be diminished. For most sports action shots, using this technique, you should be able to capture three images in a sequence: A telephoto image from a distance, a medium telephoto image as the subject nears the camera, and possibly a third wide angle image as the subject passes the camera. Using this method your chances of capturing a satisfying image will be greatly improved.



Advanced sports photography

Taking the process to the next level is as much about knowing the sport than the particular camera settings. Base your approach to camera parameters on the feeling you wish to convey. It takes a lot of experimentation to find the right mix, but most users of the Digilux 2 made the purchase decision based on just this type of photographic challenge.

Some general tips to follow:

- To freeze action, set the shutter speed between 1/500th sec. to 1/2000th sec. leaving the Aperture ring on "A"
- To explore motion blur effects, set the shutter speed between 1/30thsec. To 1/8th sec. leaving the Aperture ring on "A"
- Use the Spot AF function to help track fast moving subjects in the center of the frame
- Combine the built-in flash to help freeze action, or to enhance the subject definition when using slow shutter speeds. You may also try the second curtain sync option.



Portraiture Tips

The 28 to 90mm (35mm equivalent) lens of the Digilux 2 is ideal for photographing people. The wide angle view coupled with fast auto focus, accurate auto exposure, and virtually noiseless operation allow you to capture the most fleeting of moments. For more formal portraiture, the longer focal lengths and manual controls give you the freedom to be creative. While an entire book may be dedicated to just portraiture, we will focus on a handful of techniques well suited to the Leica Digilux 2.

Outdoor Portraits

When shooting outdoors, there are a few tips to follow that will help make a more pleasing portrait:



- Use Aperture Priority exposure mode to the widest aperture possible. (Even at the widest aperture, the Digilux will have more depth of field than an equivalent 35mm lens due to the smaller than 35mm sensor).

- In most cases, the Auto or Daylight color temperature settings will be best.

- Manual focus mode will give more control

- If shooting in shade, you may use the built-in flash as a fill light.

Composition tips:

- If possible situate yourself in an area that is shaded from direct sun to reduce the effects of flare, and try not to have your subject in the open sunlight.

- Try to keep distracting objects in the background from competing with your main subject.

- Practice using the bounce flash as a fill light to add to the shadow exposure. The bounce flash adds a nicer catch light in the eyes, and is not prone to the red eye effect.

Indoor Portraiture

Shooting portraits indoors is always a challenge, as interiors are almost always mixed light situations, and are also often low light situations. The trick to successful indoor portraiture is to learn to evaluate the scene in terms of camera settings. Of course, you may always set the camera to fully automatic flash mode, but your images will be less interesting.

As we have mentioned before, you may take multiple approaches to your picture taking sessions. You may easily take a few images in automatic mode, and then switch to manual mode to try some more creative approaches. The greatest benefit to digital photography is the ability to shoot and evaluate unlimited images. Here are a few guidelines you may follow as you explore indoor portraiture:



- If you are shooting in interiors with light colored standard height ceilings, the built-in bounce flash is a great tool to both help with exposure, and to correct color balance. Using the bounce flash helps in two ways: the daylight color temperature helps insure accurate skin tones, and the additional light helps enhance shadow detail.

- If you are shooting in large interior spaces with high ceilings the bounce flash will not be effective. While using the direct flash would tend to overpower the ambient light, there is another option with the built-in flash. By using the built-in flash along with manual exposure settings, you may fine tune the balance between ambient light and the flash exposure.

Studio Lighting

The Leica Digilux 2 may be used in conjunction with electronic studio flash lighting equipment for an even higher level of control for portraiture or still-life applications. When using external lighting, manual exposure mode operation, and the histogram will allow you to quickly establish the proper exposure. To configure the Digilux 2 for studio lighting, follow these steps:

You will need the following items:

- a Kodak 18% Grey Card
- a Hot Shoe to PC adaptor, or a radio remote unit.

Note: Certain older studio electronic flash units carry high voltage across the PC cord connector which may damage the electronics in your Digilux 2 camera. The camera has been tested by Leica engineers up to 280 volts ++. If unsure of your flash equipment consult your manufacturer before connecting a sync cable directly to your Digilux 2. Using a radio remote to trigger your lighting will prevent the possibility of damaging your camera, and will also eliminate cumbersome cabling.



- Set the Digilux to Flash Mode
- Set the camera to any shutter speed (you may sync up to 1/2000 sec.)
- Set the aperture to a middle Aperture (f/8)
- Set the camera ASA to 100
- Position your lighting and place the Kodak gray card in the scene
- Take a test exposure, and make a visual evaluation of the image on screen. Adjust the light power, light distance, or aperture until the scene looks properly exposed.



- To fine tune the exposure, choose the image histogram from the display menu. The peak of the histogram should be centered between the darkest point (left) and the lightest point (right) of the image histogram.
- Set the camera to manual white balance mode. You will be prompted to capture an image of the grey card. Once you capture the grey card image, every subsequent image will inherit the proper color balance.

Using the above procedure will help you establish a repeatable process that will lead to more color and exposure. The few moments of time you spend up front will, dramatically reduce the time you will spend editing color and density on your computer, and your work will be more consistent.

Note: If your studio lighting is too powerful, you may purchase a neutral density filter to reduce the exposure. Neutral density filters often come in sets calibrated to f-stop equivalent densities. As the camera is in manual mode, and the image display is driven from the sensor captured data, focussing will not be affected by the addition of the ND filter. The E69 Filter adapter will be required to mount filters to the lens.



Environmental Portraits

Many times a traditional portrait is an uncomfortable process for the subject. If you have trouble getting people to pose for your images, try exploring environmental portraiture. People are more comfortable in their own environments, and you will find that this type of portraiture may be highly successful.



Before you begin:

Environmental portraits are often created indoors under mixed lighting conditions. While you may shoot in raw mode, the time delay will interfere with the spontaneity of the session. Careful attention will have to be paid to the color balance settings, as in JPEG mode, your color and exposure decisions will be final. We suggest taking several test exposures in the environment before introducing your subject, so you may focus on the session once you are happy with the camera settings.

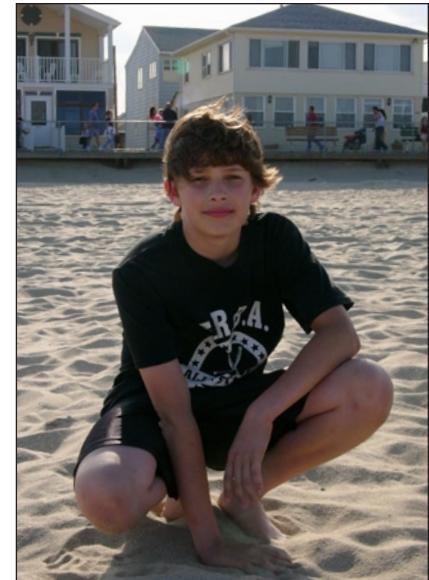
- Set the camera on one of the automatic modes to begin. The mode you choose should be determined by the mood you wish to convey
- Take a test shot of the environment (without the subject, if possible)
- Evaluate the exposure and color balance.
- If color balance is difficult, try using the built-in bounce flash to introduce daylight balanced color into the scene while still retaining the ambiance of the environment.

Backlighting

Backlighting is a very common photographic situation, yet many photographers shy away from backlit situations as achieving a proper exposure may be difficult. The problem stems from a general over-reliance on automatic focus and exposure systems on today's cameras. The manual controls of the Digitilux 2 allow you to take a new approach to backlit photography. In this section we will give you some pointers on backlit photography using both automatic and manual exposure modes.

Backlighting in automatic mode

If you are interested in using the Digitilux in automatic mode for quickly evolving photographic situations, there are a few things to keep in mind. Camera meters are based on the principle that a typical scene has an average gray balance between light and dark. In a perfectly average scene the middle gray point is equivalent to an 18% gray card. This is why when you point an automatic camera towards a white wall, the wall will always photograph as a gray tone. It is also why when you shoot predominantly dark scenes, the images always appear lighter than expected.



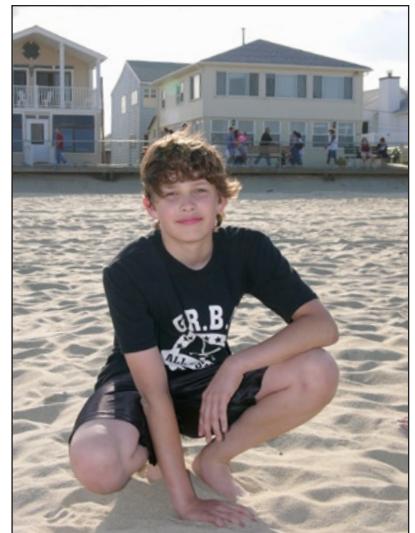
Once you start to think in terms of how the metering process works you quickly realize why Leica included three metering modes and two auto focus modes in the design of the camera.



Average metering mode looks at the entire scene to evaluate the tonal range. If the scene is predominantly light, the meter will tend to under-expose the subject.



Spot metering mode gives you precise control of the metering area. Only the area in the small cross hairs is utilized for exposure evaluation. Using spot metering mode you may literally pick individual items in a scene to expose to. In this example the spot meter exposed for the dark shirt, resulting in an image that is too light overall. Spot metering is accurate, but may be difficult to use in fast-paced shooting situations.



Average metering mode supplemented with the built-in flash helps strike the right balance between the subject and background. Using the flash output EV control, you may adjust the fill flash exposure to reach the desired subject brightness.

To evaluate exposure in the various modes, you may position your camera, frame your subject and press the shutter halfway to hold the setting when the desired exposure is achieved. Pressing the shutter all the way will take the picture. Once you let go of the shutter button, the process begins again.

Note: Due to the need to deliver a real-time preview for focus from the sensor data, you may find that the displayed image does not reflect the effect of the exposure adjustments. If possible you may wish to quickly review your image immediately after capture to verify that the exposure is what you expected.

Backlighting in Manual Mode

In some ways challenging lighting situations are best approached using manual exposure. While it may take a few moments to think out the approach you wish to take, the resulting image will be tailored to your specific creative goals.

Using Manual Exposure mode you may find the best exposure for the scene by simply taking several images and adjusting the aperture as needed. When reviewing your images, you may use the image histogram display as a guide to the tonal distribution to insure the best output quality.

Manual Exposure with Fill Flash

Due to the extremely wide tonal range of backlit scenes, it is often helpful to use the built-in direct or bounce flash to provide more detail and control of color balance in the shadow areas of your image.

It takes practice to find the right mix of settings as there are almost unlimited variables, but the following steps will be useful as you begin testing this approach.

Using the Aperture and Shutter Speed controls and the image preview histogram display, find an exposure point where the histogram is balanced between dark and light tones.

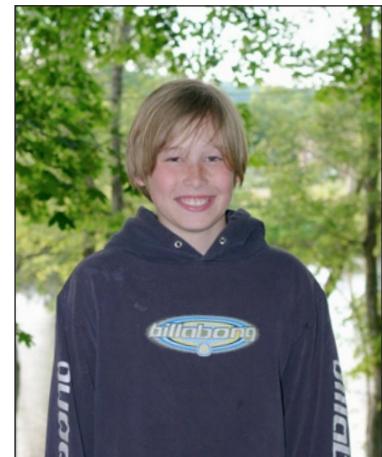
Once you arrive at a balanced exposure, turn on the built-in flash and take a picture. If the flash exposure is too bright, you may try the bounce flash position to provide indirect lighting. The flash exposure may be controlled by pressing the EV button on the back of the camera three times, and using the control dial to lighten or darken the flash exposure. You may have to also adjust your aperture and/or shutter speed to fine tune the overall exposure balance.



This image was exposed manually with strong backlighting.

Evaluate the image and the effect of the flash fill. You will notice that the foreground will have considerably more detail, and the color balance will be neutral. If you want a more dramatic effect you may choose to manually set the color balance to different settings.

When photographing in this mode, you are in full control of the camera, and the only guide is the mood you wish to achieve. Spending time with this type of photography is infinitely more rewarding than sitting in front of the computer trying to re-create what could be done much more naturally in camera.



This image was exposed manually with strong backlighting. The camera's built-in flash was used as a fill light to balance the exposure.

Chapter Six

Common Photographic Problems

Common Photographic Problems

While we have tried to anticipate the types of photography you may encounter in the creation of this guide, it is almost certain that you will run into situations where what is happening with your captures simply does not make sense.

After spending many hours with the Digilux 2, I have collected a gallery of failed images. These images are valuable as they indicate what went wrong based on exposure, color balance, and other capture parameters stored in each image file. When a picture is not successful, you will learn quickly what settings to avoid, and with some further testing, you will improve the quality in future sessions under similar conditions.

Vibration

Often times you will take a picture that appears sharp and bright on the display, only to find out after the fact that the image is not sharp due to motion at capture. I prefer to zoom into the image on the camera display just to be sure that the focus is sharp. If an image appears blurry in most cases this is caused by low light levels in programmed auto exposure mode.

Suggestions:

- Adjust your ASA upwards i.e.: 100 to 200
- Switch to Shutter Priority automatic mode and set the shutter speed at a speed that matches your lens focal length. For example 60mm=1/60th sec.
- Use a wider angle lens setting (to minimize the effect of motion)
- Try using the built-in Flash/Fill Flash
- Use a tripod or other camera support
- Place the camera on a stable surface and use the self timer to trigger the exposure or use the optional remote release cable.

When shooting in bright situations such as sand or snow the images appear too dark

As discussed in the backlighting section earlier in this guide, the camera's meter is attempting to achieve an ideal exposure balance. Since the camera sees a predominance of light tones, it attempts to correct this by biasing the exposure to a darker point. There are several ways to compensate for this effect.

Suggestions:

- Use the EV button and the adjustment dial to add a lighter bias to the auto exposure. A setting of +2 EV is a good starting point. Going too far will result in blown out highlights with no data.
- Use the Center weighted, or Spot metering modes to help the camera meter expose the subject as opposed to the background.
- If the above settings do not give you the desired results try manual mode, but keep in mind that this will generally require more time to verify exposures as you go.

When shooting in dark situations such as night scenes, the images look flat and too light

As discussed in the Night/Low Light section earlier in this guide, the camera's meter is attempting to achieve an ideal exposure balance. Since the camera sees a predominance of dark tones, it attempts to correct this by biasing the exposure to a lighter point. There are several ways to compensate for this effect.

Suggestions:

- Use the EV button and the adjustment dial to add a darker bias to the auto exposure. 1 to 2EV darker should work well. Going too far will result in too much shadow density, and overall underexposure.

•Use manual mode, and bracket your exposures. Keep in mind that this will generally require more time to verify exposures as you go.

•Use raw mode to protect as much original data as possible, as you may wish to fine tune the images in Adobe® Camera Raw™ or Lasersoft Silverfast.

Note: When switching settings to compensate to specific situations it is a good practice to reset the camera back to its normal settings when finished. I have ruined a good number of images by leaving custom camera settings in place.

The flash overpowers the ambient light

The built-in flash has been designed to provide even exposure across the focal length of the built-in lens for distances from approximately 3 to 10 feet. In situations where ambient light is low, the background will go dark. If the ambient light is near the exposure value of the flash, a pleasing balance will be achieved. Balancing the two exposures may be challenging-especially at dusk when the ambient light values will change rapidly. There are several methods to compensate for the difference between the flash and ambient light.

- Try using the Flash EV control to lower the flash power
- Switch to aperture priority and select a wider aperture
- Switch to full manual mode, and select a longer exposure time (shutter speeds below 1/30th sec. will begin to introduce a motion blur effect. You may also experiment with the second curtain flash sync to alter the effect of the flash portion of the exposure)
- Use the optional external flash unit
- Try the A-s Flash Mode which is optimized for use with slower shutter speeds



28mm
1.0 Sec.
f 7.1
Manual Exposure
ASA100



50mm
1/60 Sec.
f 2.1
Manual Exposure
Flash (Direct)
ASA 100



50mm
.5 Sec.
f 3.2
Manual Exposure
Flash (Direct, -1 EV)
ASA 100

"When I first heard of the Digilux 2 camera, I expected the camera to be decent, but I was pleasantly surprised by the flexibility of the camera's built-in controls and excellent image quality.

I have used digital cameras since the late eighties, but I cannot remember a camera that has struck such a perfect balance between ease of use, and photographic flexibility. I don't know if it's the manual focus, the built-in fill flash, or the manual exposure controls, but this camera has allowed me to create images that are well beyond what I would expect from a camera in this price range".

Scott Geffert

About the Author



Scott Geffert is the president and co-founder of Center for Digital Imaging Inc., a New York City based technology consulting firm specializing in digital photography and imaging workflow.

A graduate of Rochester Institute of Technology, Scott has been involved with Photography since 1976, and the Apple® Macintosh™ computer platform since 1984.

Early in his career, Scott worked in photo labs, sold lighting equipment (Balcar), and created the country's first dedicated digital imaging sales center for New York's Ken Hansen Photographic in 1989.

In 1996 Scott, and his partner Howard Goldstein created Center for Digital Imaging Inc. a company dedicated to building digital imaging workflow solutions for the commercial photography market.

Known for maintaining the highest quality standards and process control, CDI has been retained by leading art institutions, photographers, and corporations to develop and support digital imaging initiatives.

CDI has produced seminars and training materials for various manufacturers and trade organizations, and in 2003 CDI was invited to produce the Digital Learning Center at the Photo Plus East photography trade show in New York. This event highlighted the workflow of The Metropolitan Museum of Art, one of CDI's first clients. CDI has been retained to produce the 2004 event. This book is Scott's second field guide project.

More are planned for the future.



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