

# THE ULTIMATE tethering guide

Your complete workflow guide to:

Image Transfer Tools | Software | File Management | Back Up & Storage



Tether Tools and the American Society of Media Photographers (ASMP) have come together to create the Ultimate Tethering Guide out of a shared commitment to providing the creative community with the most valuable and useful resources that support the professional practice of still and motion photography.

This Guide details the benefits of tethering as well as the best gear and software to use to maximize your results.

We touch on topics like how to set up your workflow, which tethering cables are best for your specific camera model, options for wireless tethering, setting up file management systems, backing up your work, and workflow security. And that's just the beginning!

Throughout the guide, we'll also direct you to many more great resources for staying on top of the latest advancements in workflow technology.

## CONTRIBUTORS

Thank you to all the amazing photographers, writers and industry experts who contributed to the creation of this guide. It would not have been possible without you!

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## ABOUT TETHER TOOLS

Tether Tools® is a design and manufacturing company providing innovative custom photography equipment and accessories for in studio and on location photo and video shoots. Tether Tools is committed to providing the highest quality tethering and workstation solutions for creatives. Connect with Tether Tools directly at [www.tether-tools.com](http://www.tether-tools.com)

## CONNECT WITH TETHER TOOLS

**Tether Talk:** The go-to online resource for tethered photography. This blog offers knowledgeable insight on the latest gear and software, while also connecting you with top industry professionals for advice on everything from photography workflow to marketing and sales tips.

**Tether Tools Newsletter:** Stay connected with our monthly newsletter and be the first to know about new product releases, deals, special events and more.

**Facebook:** Join 23,000+ other professional photographers for an interactive online experience that presents the latest industry news, contests, and behind-the-scenes sneak peeks.

**Twitter:** Real-time conversations with the Tether Tools team and top photographers spanning almost every industry imaginable!

**Instagram:** The best place to catch a behind-the-scenes glimpse of tethered workflow from photographers around the globe.



## ABOUT ASMP

The American Society of Media Photographers (ASMP) is the premier trade association for the world's most respected still and motion photographers. ASMP is the leader in promoting photographers' rights, providing education in better business practices, producing business publications for photographers, and helping to connect purchasers with professional photographers. Founded in 1944, ASMP has more than 6,500 members and 39 chapters. In addition to a wide range of discounts and benefits, ASMP members gain the support of an international community of peers and a fearless advocate championing their interests in Congress, contracts and the courts.

## CONNECT WITH ASMP

**ASMP Resources:** ASMP offers invaluable online resources to help you master the business side of the business. Access timely webinars, tutorials, guides and more.

**Strictly Business Blog:** One of the most widely read blogs in the industry, ASMP's Strictly Business blog features posts by industry insiders, legal advisors, and technical experts.

**Facebook & Twitter** Follow ASMP on social media for news, inspiration and more.

**Community:** Connect with members locally and online through the ASMP community.

**CHAPTER 1 - Introduction to Tethering**

**CHAPTER 2 - Tethering Requirements**

**CHAPTER 3 - Tethering Software**

**CHAPTER 4 - File Management Resources**

**CHAPTER 5 - Tethering with Cables**

**CHAPTER 6 - Wireless Tethering**

**CHAPTER 7 - Medium Format & Digital Backs**

**CHAPTER 8 - Backing up**



## INTRODUCTION TO TETHERING

There's a lot happening on the average photo shoot. From models and assistants to props and gear, it's often organized chaos. When you've got so many moving parts, one of the most important things you can do for your work (and sanity!) is to set up an archival tethering system. In this guide, we'll dive deep into this topic and provide you with critical tools for your photography career. Let's start with the basics.

### WHAT IS TETHERING?

Tethering is the connecting of a single device to another device. The term tethering encompasses the actual connectivity of digital devices as well as the integration and mounting of these devices. In the context of photo and video, both wired and wireless solutions may be used to transfer information (images, video) from your camera to another device.

### WHAT IS TETHERED PHOTOGRAPHY?

Images captured using a tethered photography workflow get saved directly onto your computer's hard drive in the folder of your choice. Tethering software then displays the images on the larger computer or tablet screen as they are captured so you can see them clearly. In some instances, what we call tethering is sometimes referred to as Direct or Instant Image Transfer – this is how you will often find it listed in camera and software manuals.

### WHAT IS ARCHIVAL TETHERING?

Archival tethering adds an archival backup system for your images into your tethering workflow. Tethered photography allows you to send copies to your computer, an external hard drive, or even your tablet or smartphone. When you set up an archival tethering system, every capture from every tethered shoot is automatically saved, secured, named and backed-up. Managing and organizing your photos as they're captured, lets you spend more time shooting and less time filing. Plus you'll be able to find specific photos you've already taken quickly and easily.

### WHY IS IT IMPORTANT?

Tethering helps you get the perfect photo in fewer shots. Viewing images on a larger screen is a great way for you and your clients to spot issues with focus, lighting, posing or composition. You'll spend less time editing and your clients can let you know the moment you've captured the shot they are looking for. From shoot to publishing, archival tethering speeds up the process in a major way.

### BENEFITS TO SHOOTING TETHERED

- View images on a large monitor as you shoot
- Instantly see images at full resolution
- Check critical focus, composition, styling
- Adjust lighting and camera settings more quickly and easily

- Control camera settings and remote trigger from connected device
- Share images with art director/client on site or remotely
- Collaborate more effectively with assistants, stylists and subjects
- Tag, rate, compare and share images while you shoot
- Share images on multiple devices
- Back up files to hard-drive while shooting
- Move images from laptop to desktop in an instant
- Reduce the chance of image loss

Tethering is also an exceptional on-site teaching tool for instructors and workshop attendees. Being able to view images on a large screen as they're captured facilitates discussion and helps students master technical skills, refine techniques and develop their eye much more quickly.

### NEW TO TETHERING?

Like any process, the more into it you get, the more involved it can become, but setting up a basic tethered photography system is actually very quick & simple. The easiest way is to try it out using equipment you may already have at home or in your studio. All you need is:

- A camera that supports instant image transfer
- A compatible cable to connect your camera to a computer
- Software to receive the images being sent

### TO SET UP A SIMPLE SHOOT:

1. Connect your camera, via the cable to your computer
2. Start your [software program](#)
3. Set up a tethered capture session and select a folder to receive images
4. Begin shooting – and seeing your images on your screen instantly

For a more secure and stable set up that can be transported easily, you might consider something like this:

- Camera of choice
- [Tether Pro Cable](#) that's compatible with your camera
- Laptop or tablet to receive images
- [Cable retention device for your camera and computer port](#)
- [Tether Table](#) – to hold laptop for your camera and computer ports
- [Secure Strap](#) – to keep laptop secure
- [External Drive Compartment](#) and back up hard drive
- Tripod or C Stand – to hold laptop table
- Cross Bar & Ballhead - optional to also hold camera



Photo: Tether Tools

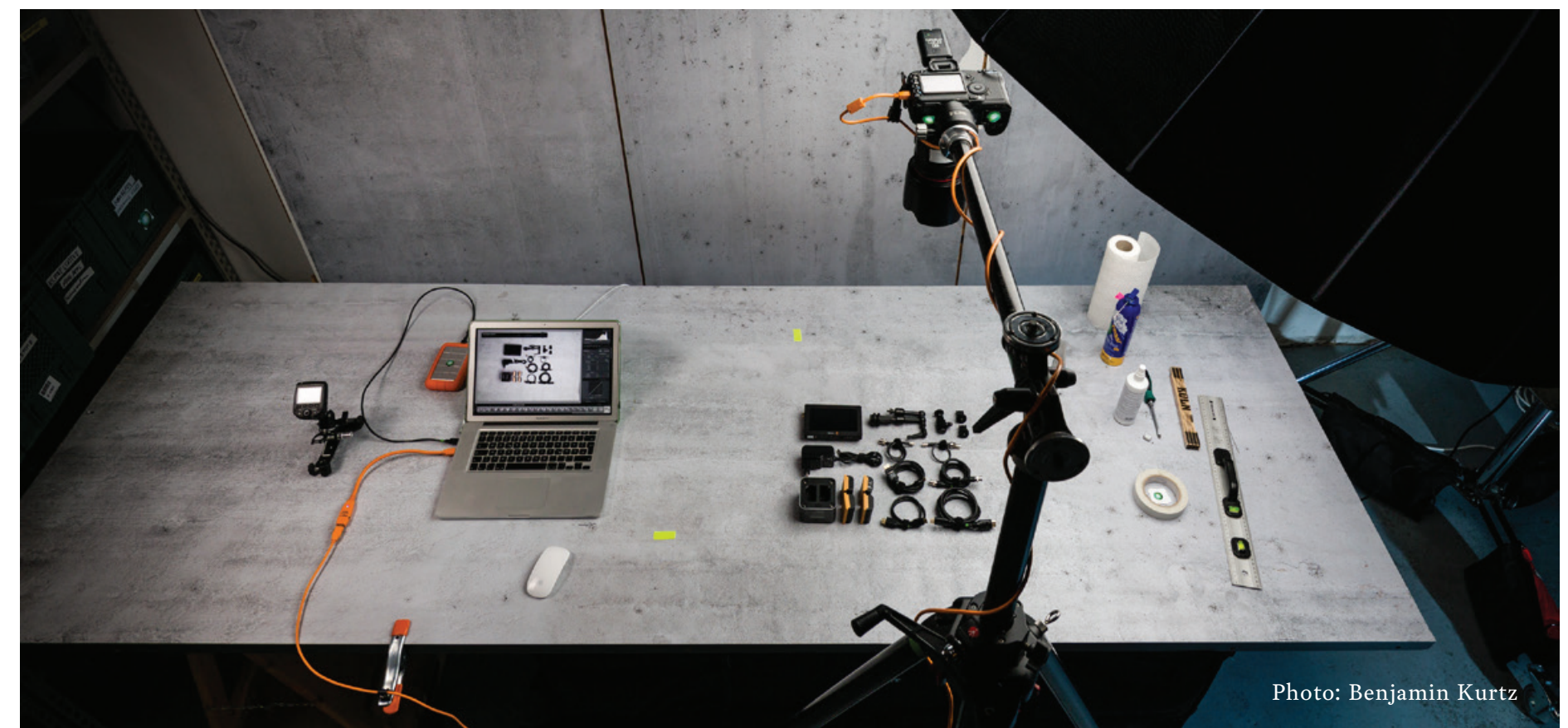


Photo: Benjamin Kurtz



## TETHERING REQUIREMENTS

**B**efore you can begin tethering, you need to learn the specific requirements for both your camera and computer.



### CAMERA REQUIREMENTS FOR TETHERING

Most DSLR, mirrorless and medium format cameras are USB- or Firewire-compatible, meaning they have a USB or Firewire port for copying images from a card to a computer. However this does not necessarily mean that the camera has tethering capabilities. Tethering is the ability to transfer images immediately during the capture process. Growing demand for tethering has led manufacturers to introduce and improve tethering functionality in many newer cameras. Even so, you should reference your camera manual to confirm that it's capable of tethering and if so, identify which types of images it's designed to transfer – JPEG, RAW or both. Remember to look for the phrases Direct Image Transfer and Instant Image Transfer as well as any references to tethering.

Some camera models support Parallel File Writing, where images are written simultaneously to both the memory card and the computer or tablet to which you are tethered. As of this writing, Canon is the only manufacturer offering this solution. For those using Sony, Nikon and other manufacturers that do not offer parallel file writing in camera, we offer some work-arounds later in this guide. Some cameras require their manufacturers' proprietary software in order to tether, while others can use many of the familiar tethering software solutions we discuss in Chapter 3.

### COMPUTER REQUIREMENTS FOR TETHERING

For any working professional, time is money. To avoid costly slowdowns and transfer issues when shooting tethered, you need to match your computer's RAM and processing speed to the size of the files you're transferring. As we cover the requirements for tethered photography from the computer's standpoint, you'll want to check your computer's specifications to see exactly how your machine has been configured.

Some important terms to know when reviewing computer requirements:

- RAM: Random Access Memory
- RPM: Revolutions Per Minute
- SSD: Solid State Drive
- RAID: Redundant Array of Inexpensive/Independent Disks

The best place to start is with the computer's memory, or [RAM](#) - what many of us like to think of as the "muscle" of the computer. When a photograph is being transferred through a wired or wireless connection, the computer's RAM has to quickly process the image data so that the computer's processor can display the image on screen. Having enough RAM ensures that your computer can:

- Connect effectively to your tethering software of choice
- Perform at optimal transfer speeds so that images appear quickly as they go from camera to computer
- Support efficient post-processing of image files

If your tethering computer doubles as your primary storage device, you will want to make sure its hard drive has fast read and write times. Data redundancy (having multiple copies of your data) is key to keeping your data safe. The safest redundant scheme is the [3-2-1 system](#). At minimum, we recommend that you maintain separate devices for your [primary](#) and [archival](#) storage. You may also want the extra data security provided by drive-spanning devices like a [RAID](#).

For most tethering set ups, the following minimum configurations should be effective:

### FOR LAPTOPS:

- Install at least 16GB of RAM
- Utilize external hard drives. They offer larger storage capacities than internal drives and are much more cost effective. External drives also offer easy portability for moving files to a desktop workstation for post-production.
- Use hard drives with 7200 or faster RPM. The higher the RPM the faster your computer can read and write large image files.

### FOR DESKTOPS:

- Install at least 16GB of RAM
- Install large internal storage drives with 7200 RPM or faster to support file transfer speed and capacity.
- Consider using a [Solid State Drive \(SSD\)](#) to run software applications.



#### NOTE:

The drives you use for archive files do not have to be as fast as those you use for capturing files while shooting tethered.

- Be sure to check your camera's manual to determine if it supports Instant Image Transfer. To access your [Canon camera's manual online](#), select your camera's model name, then scroll down to 'direct image transfer' to find out what type of image transfer options (jpeg or raw or both) are available.
- To access your [Nikon camera's manual online](#), locate the 'USB connector' section of the manual to find out which cable it requires to tether.
- To access your [Sony Camera's Manual Online](#), select 'camera', then click on your specific camera series and model. Under marketing specs, scroll down to 'interface' which will show you the USB port that is required for that camera. In the 'user guide (printable pdf)', find the section called 'remote camera control' which will show you how to setup your camera for tethering and provide information on downloading the software.
- Before purchasing a tethering cable, be sure to reference the [Cable Compatibility Guide](#) from Tether Tools.



Photo: John Keatley

# TETHERING SOFTWARE

This chapter addresses the software side of tethered photography (the transfer, and in some cases, transfer and copying, of image files from your camera to your computer). There are quite a few tethering software options out there. We will cover the following:

- Adobe Photoshop Lightroom
- Capture One Pro
- Darkroom Core
- Smart Shooter
- Manufacturer Software
- 3rd party Software Options

Each section will highlight a software solution, current supported cameras, and instructional set-up guide as well as bonus information to improve your tethering experience. (Please note the information covered in this chapter is based on the software available at this time. Features change frequently so check your software documentation for the latest specifications.)

## TETHERING SOFTWARE INTRODUCTION

Software developers continually upgrade features and functions. To find a compatible software that meets your needs, visit this Tethering Software Finder at [Tether Tools.com](https://www.tether-tools.com)

There are many software options to choose from, but some programs are more popular than others. Among the favorites of professional photog-

raphers are Adobe Photoshop Lightroom, Capture One Pro, Canon EOS Utility, and Nikon Camera Control Pro.

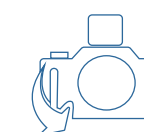
## ADOBE PHOTOSHOP LIGHTROOM



Adobe Photoshop Lightroom is a comprehensive RAW processing and photo management application that includes tethering functionality for select Canon, Nikon and Leica digital cameras. Lightroom offers only limited access to camera settings directly from a computer but fully supports instant viewing, zooming, rating and tagging of shots. You can even set it up to import photos into a specific Lightroom catalog as they are taken. Like all other tethering software, Lightroom displays your high resolution files on the tethered screen as you capture them, so you can easily check focus, lighting and composition in great detail. Lightroom is available for both Windows and Mac.

## LIGHTROOM SUPPORTED CAMERAS

The Adobe Camera RAW plug-in (ACR), which can be accessed via Lightroom, supports hundreds of cameras by various camera manufacturers. ACR allows you to import photos, process those files and convert them to other output formats. However, just because a camera is supported in ACR does not mean it can be tethered using Lightroom.



[Adobe camera RAW](https://www.adobe.com/products/camera-raw.html) supported cameras

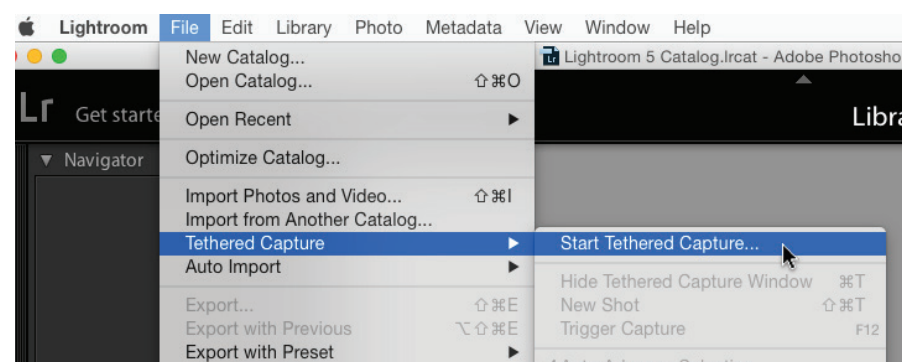


# LIGHTROOM INSTRUCTIONAL SET-UP GUIDE

Written by Terry White

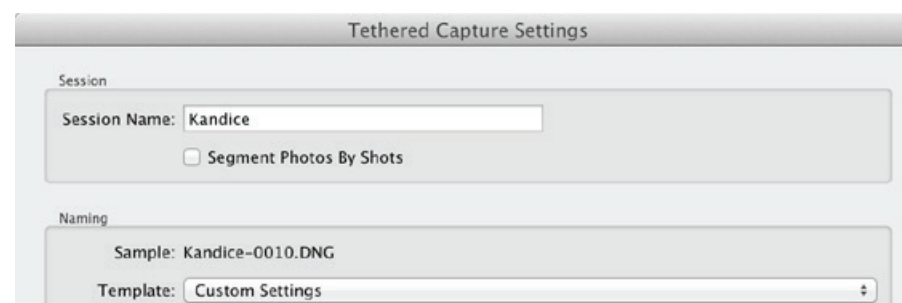
This section will take you step-by-step through setting up your compatible camera to shoot via a tethering cable directly into Lightroom on your computer.

## 1. GETTING STARTED



In most cases, it does not matter whether you plug in or turn on your camera before or after starting your tethering software. However, for best practices, make sure your camera and tethering cable are not yet connected to your computer. Launch Lightroom and Choose Tethered Capture > Start Tethered Capture from the File Menu. You will then see a dialog box where you can set all of your options.

## 2. ENTER THE SESSION NAME



The session name is the name that will be given to the folder that your pictures will be placed in as well as the name assigned to your pictures as they come in. It's best to keep this name short and not use any special characters that could be incompatible with your operating system. See dpBestflow's section on [file management](#) for folder and file naming best practices.

## 3. SEGMENT PHOTOS BY SHOTS (optional)

If you are capturing a number of different looks or scenarios in a single session and wish to organize them into sub-folders within the primary folder for the session, check the "Segment Photos by Shots" box. If you leave the box unchecked, all files captured in the session will go into a single folder.

Let's say you are doing a fashion shoot with three models – Ann, Mike and Susan – and you want to store the photos taken of each model in separate folders. You'll start by giving a name for the whole session – let's say you give it the 'Session Name' of "Fashion Shoot." You will then check the box for "Segment Photos by Shots" to create folders for each of your models.

Once you begin the session, another dialog box will ask for the name of the first "Segment." You would then enter the first model's name you will be working with. Let's say its "Ann." When Ann's shoot is complete, all of the images will be in the "Ann" sub-folder under "Fashion Shoot." When it's time to photograph Mike, press:

FOR MAC:



FOR PC:



This will bring up a new window that lets you name your next segment. Enter "Mike" for the Segment name and Mike's shots will now go into this sub-folder.

Once you've created a new segment, you can still return to any segments created earlier so if Ann needs to go back on set, you can switch to her sub-folder, and then go back to Mike's.

## 4. NAMING

In the "Naming" section, you determine how you want each shot to be named. Typically using the "Session" or "Shot Name" and a 4-digit number (i.e. 0123) will work. You can either choose a pre-defined naming template or create your own custom settings. Refer to the dpBestflow [File Naming](#) section for recommended best practices.

## 5. DESTINATION

This determines where Lightroom saves the image data you're transferring to this computer. You should choose a location/drive that has plenty of space for the number of images you anticipate bringing in, especially if you're shooting in RAW. It can be an internal or external drive.

## 6. INFORMATION

In the information section you can choose an existing metadata template or create one on the fly. Lightroom will embed the information entered here into the metadata of each image. At a minimum, we recommend embedding your copyright info, name and studio website.



TIP:

You can save the metadata template and name it so you can reuse the template instead of inputting new information each time.

## 7. KEYWORDS

Inputting keywords is simple. Just make sure you separate each keyword you add to your files by commas. Once this is done, keywords can be searched to help you find the images you want in the future. Remember, keywords entered at this stage of the process will be applied to all images captured in this session. If you wish to apply more specific keywords to individual images or groups of images within the session, you will do that as a separate step once those images are captured. dpBestflow's [Keywording](#) best practices can help you develop an effective keyword strategy.

## 8. CONNECT YOUR CAMERA

When you click "OK," Lightroom will bring up the Tether Capture Window. Once that appears, connect your camera using the compatible cable, then turn your camera on. Shortly after you turn on your connected camera, it will appear in the Lightroom window. Now, you're ready to shoot.



NOTE:

If you already have images on your camera's memory card, it may take longer than expected for your camera to appear as your computer will read it as a storage device and want to verify each and every image on that card before showing the camera to Lightroom. This means that it may look like your camera is not connected for several seconds.



### Nikon & Leica Users

If you're a Nikon or Leica shooter you can remove the card(s) from your camera since shooting tethered with these cameras only sends the images to your computer, NOT to your cards.

### Canon Users

If you're a Canon shooter you can either remove or erase the card so it doesn't take as long for the camera to show up on the tether bar in Lightroom.

### 9. CLICK OK AND LET'S CAPTURE

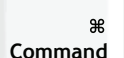

As you capture each image, it will be transferred via USB to the folder on your hard drive that you chose (and have displayed) in Lightroom.

#### DEVELOP SETTINGS TIP:

If you want images auto corrected as you capture into Lightroom, use the Develop Settings in the tether window. Capture the first image and open it in the Develop Module. Now, make any adjustments you want such as White Balance, Crop, etc. When finished switch back to the tether window and set the Develop Setting to "Same as Previous." All images moving forward will be adjusted using the same settings as the previous image.

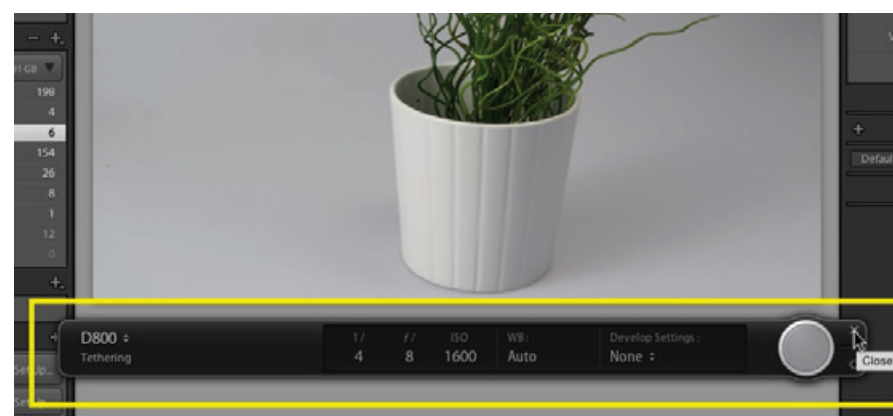
### 10. HIDE THE TETHER CAPTURE WINDOW

Shooting tethered is fantastic but sometimes, the tether window can get in the way of the images. You can hide it by pressing the "F" key to enter Full-Screen mode. Pressing the "F" key again will take you out of Full-Screen mode whenever you need to bring the Tether Capture window back up. If you prefer to capture using Loupe view, press the letter "E" on your keyboard. Once you are in Loupe View, pressing "Command+T" or CTRL+T" will hide or show the Tether Capture window while you're shooting.

**FOR MAC:**  **T** **FOR PC:**  **T**

### 11. ENDING YOUR SHOOT

When you're done with the shoot, click the "X" in the upper right-hand corner of your Tethered Capture Window to end your Tethered Capture session.



#### DEVELOP SETTINGS TIP:

Once the session is ended, Lightroom will stop importing any more images even if you continue to shoot with the camera attached via cable. If you want Lightroom to start importing images again after you've ended the session, simply start a new session.

It is recommended to unplug your cable, coil and store it properly at this point. If you wish to continue shooting untethered, and your camera's LCD is disabled during tethered shooting (common in some cameras), removing the cable will return the LCD panel to normal shooting functions. If you removed a card before your tethered shoot, re-insert a card now to save images to the card.

### 12. NEXT STEP FOR IMAGES

Once you finish your tethering session, the high resolution image files are stored on your hard drive just as though you had transferred them from a memory card. You can now:

- Go through the gallery with your client/model to select favorites by flagging or rating them.
- Choose the selected images that you have flagged or rated within Lightroom and export those into Photoshop for advanced editing and photo retouching.

**TIP:** You can select which keyboard letter or number will flag or color specific images depending on their rating. See tips on ratings here

### LIGHTROOM QUICK KEYS

These quick keys offer time saving short cuts when working in Adobe PhotoShop Lightroom.



**VIDEO:** Mark Wallace shows a step-by-step set up for shooting tethered with Lightroom



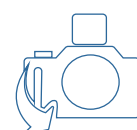
## CAPTURE ONE PRO



Phase One's Capture One Pro is a professional RAW converter and image editing software that also includes extensive tethering features. It enables you to capture, organize, edit, share and print images in a flexible and efficient cabled tethering workflow. Phase One also offers a tool/app that connects [Capture One Pro](#) to an iPad, iPod Touch or iPhone so users can present, rate, zoom and even trigger the camera wirelessly using compatible mobile devices.

## CAPTURE ONE PRO SUPPORTED CAMERAS

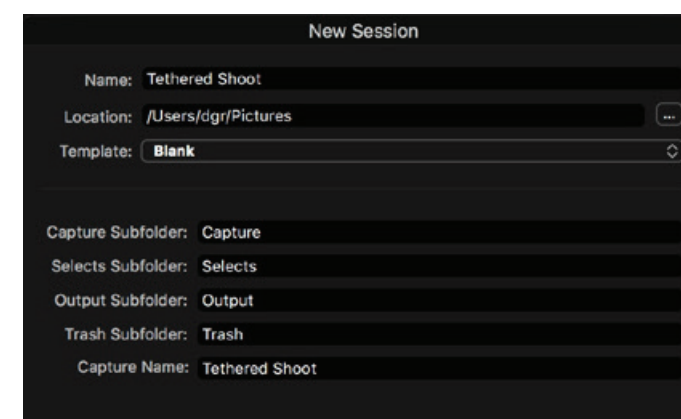
Capture One Pro supports hundreds of cameras for RAW file conversion but not all of these cameras are supported for tethered image capture.



[Capture One](#) supported cameras

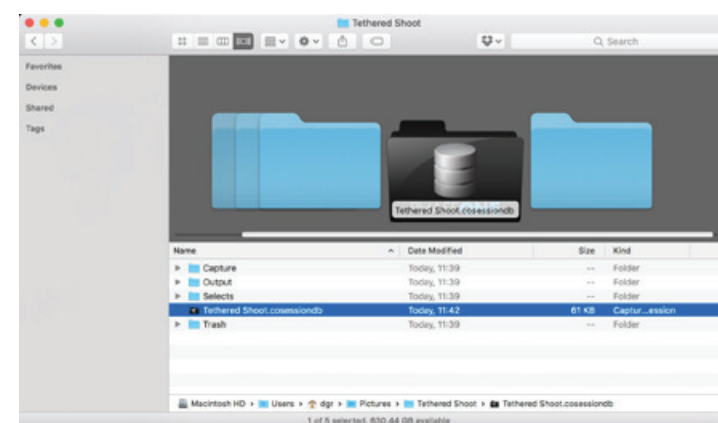
A Session simply creates a small group of nested folders that contain everything from RAW captures, selected images, exported images and even trashed images.

**1) Start a new Session in Capture One by browsing to File>New Session**



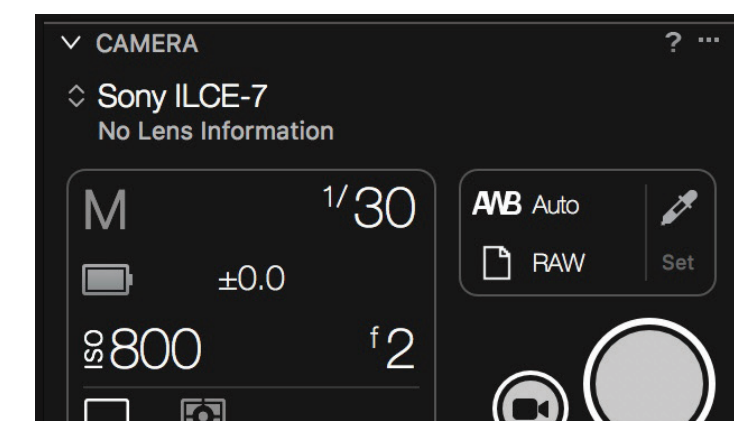
Check the Location of the Session, choose a Template\* if you have one set-up, otherwise leave as Blank. Leave everything else as default.

Once the session is created it will look like this in the Mac OS Finder or Windows Explorer.



*\*A Session Template is a fast method of setting up a typically used Session organisation to prevent repeated setup of the same parameters. Any Session can be saved as a template by choosing File>Save as Template*

**2) Connect a supported camera and verify the connection in the Camera tool**

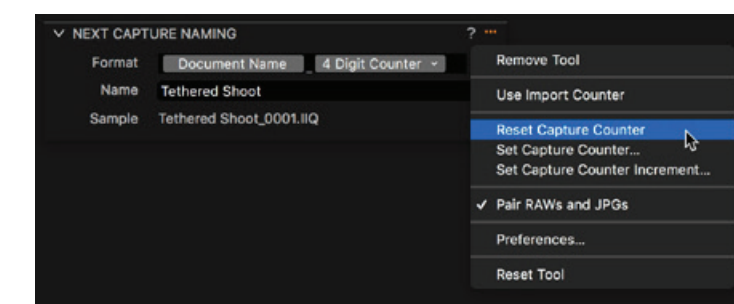


Take care to use [good quality cables](#) and observe maximum recommended lengths.

**3) Set the capture naming in the Next Capture Naming tool**

a) Decide on the Format by combining one or more Tokens to build a naming convention. Tokens can be chosen by clicking on the '...' button.

b) Capture Counters can be reset in the tool sub menu.



**4) Adjust cameras settings and capture**

The Camera tool will show us much information as possible, depending on the camera attached. Icons that are greyed out only show a particular setting and cannot be altered.

For example, if the camera has a mechanical Exposure Program dial, it is not possible to change it in the Camera tool.

Any setting that is highlighted, can be clicked on and edited.

Adjustments made on the camera itself are synchronised with Capture One.



## CAPTURE ONE PRO 10 - STEP BY STEP TO TETHERED CAPTURE

Written by David Grover

Capture One has a long history as being the industry standard in fast and robust tethering. Compatible cameras from Canon, Nikon, Sony, Phase One and Leaf can be connected for instantaneous capture.

The Capture tool tab in Capture One Pro is the gateway to tethered shooting with a compatible camera via a USB cable.

This tool tab has a host of features to aid workflow.

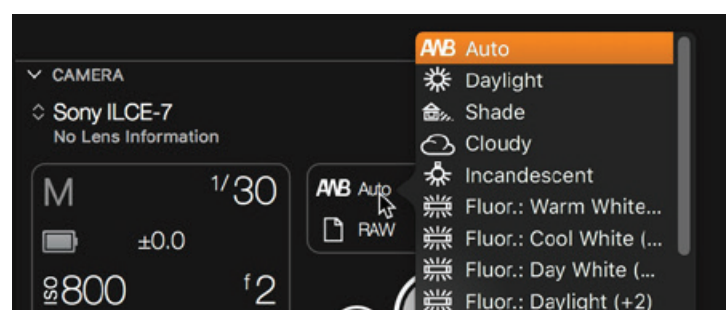
- Manage adjustments and naming during capture.
- Use the Camera and Camera Settings tool to alter camera settings and fire the shutter
- Use Live View functionality for composition and focus control

Capture Pilot is an additional tool and iOS application to connect Capture One Pro to an iPad, iPod Touch or iPhone. The Capture Pilot app lets you present, rate and capture image files remotely.

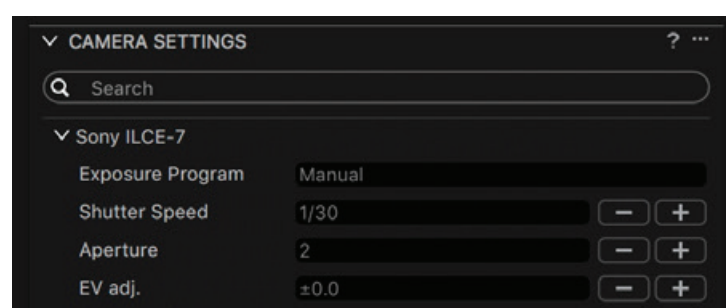
Capture Pilot also has a web function that lets you view, rate and color tag captured images from a web browser on a computer, Android device or any other hardware with a simple web browser.

### START A TETHERED SESSION

Capture One Pro has two options for file management. Images can either be stored in a Catalog (Otherwise known as a Library) or a Session. The Session based workflow makes the most sense for tethered capture.

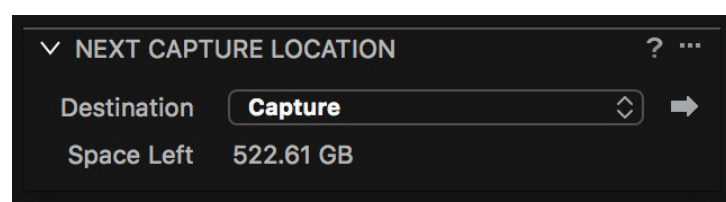


For a more extensive list of camera settings, the Camera Settings tool shows all possible editable settings. This list will vary from camera to camera.



Press the Capture button in the Camera tool or release the camera's shutter to capture an image.

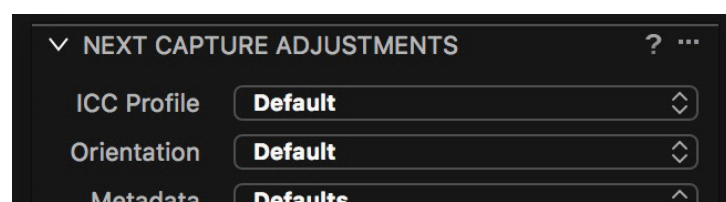
By default, images are stored in the session Capture folder but it can be changed in the Next Capture Location tool.



### 5) Applying Adjustments

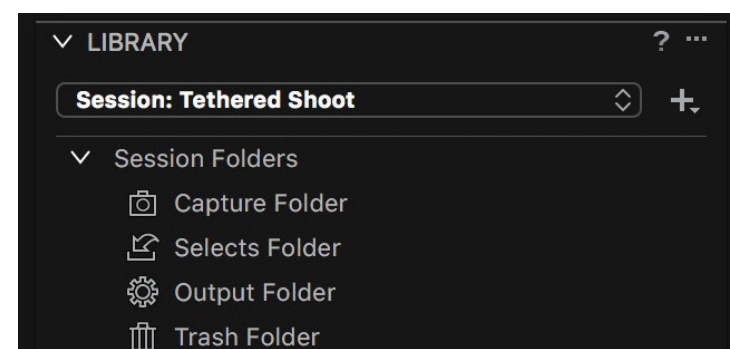
By default adjustments on the current image are copied over to subsequent captures. However, this can be influenced in the Next Capture Adjustments tool. There are options in here for changing the ICC profile, Orientation, Metadata and all other adjustments from image to image.

A Style can also be applied on capture.



### 6) Managing Files

Managing files is carried out in the Library tool in the Library Tool Tab. The Capture, Selects, Output and Trash folder can be viewed simply by clicking on them.

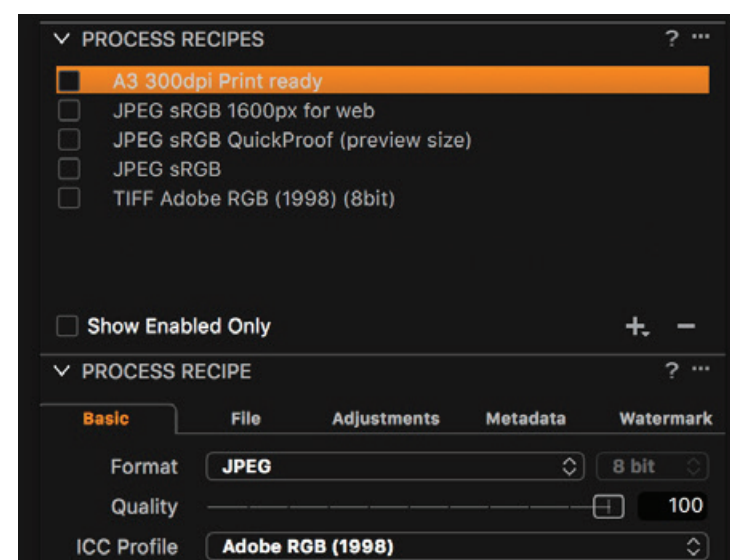


By default, captured images go to the session Capture Folder. Images can be moved to the session Selects folder by drag and drop or selecting an image and using the shortcut Cmd(Mac)/Ctrl(Win) – J. Images can be moved to the trash folder, also by drag and drop or the shortcut Cmd(Mac)/Ctrl(Win) – Backspace.

### 7) Exporting Files

By default, exported images go to the session Output folder.

- a. Select the image files for processing.
- b. Go to the Output Tool Tab.
- c. In Process Recipes, check mark (or create a new recipe) the required recipe(s) for the selected images.

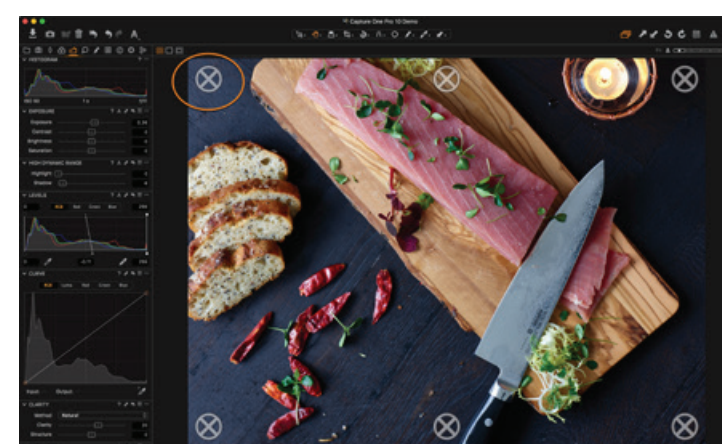


d. Press Process in the Process Summary tool or use the shortcut Cmd(Mac)/Ctrl(Win) – D

Processing can be stopped at any time, then edited and re-started from the Batch Tool Tab.

### 8) Additional Options

a) Composition Mode. This mode allows the capture of images to assess exposure, composition and focus, but without writing ALL images to disk. Choose Camera>Composition Mode or press the Composition mode icon\*



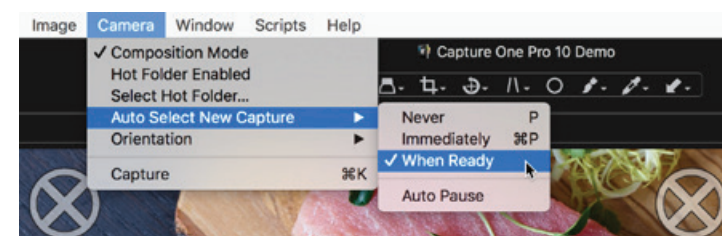
i) The Composition mode is activated as soon as the X Icon is displayed in the Viewer.

ii) Remove the Composition mode to keep test shot files.

*Note: Each new capture taken in Composition mode overwrites the previous one.*

*\*The Composition mode icon can be added to the toolbar. Go to View>Customise Toolbar*

b) Adjust which images are shown during tethered photography. This option controls how new captures are displayed in the viewer.



i) Choose Camera>Auto Select New Capture.

ii) Select the update rate of new captures from the following:

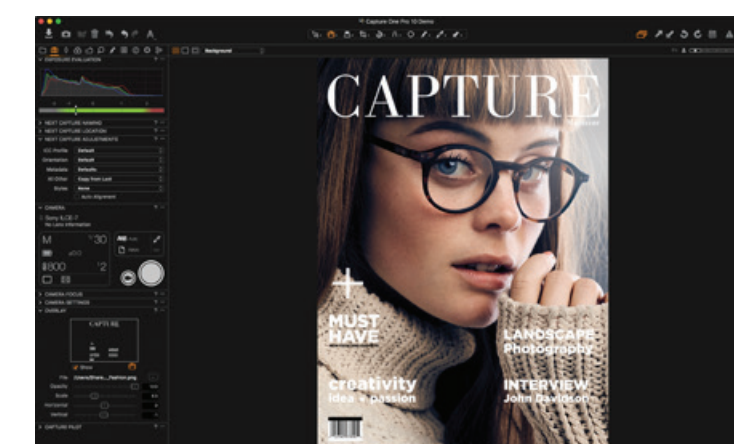
iii) Never - will show the chosen primary variant.

iv) Immediately - will show a new capture as soon as possible (before all preview calculations are done).

v) When Ready - will show new captures as soon as all auto-adjustments are done.

vi) Auto Pause - will allow the viewing of a selected primary variant while the tethered session continues.

c) Using an Overlay. An 'Overlay' can be any image file which is displayed on top of the capture. This can be useful if you need to align tethered captures to a particularly layout.



i) Go to the Capture tool tab.

ii) Drag and drop an overlay file into the specified area.

iii) Adjust the overlay file if needed with the Opacity and positioning sliders

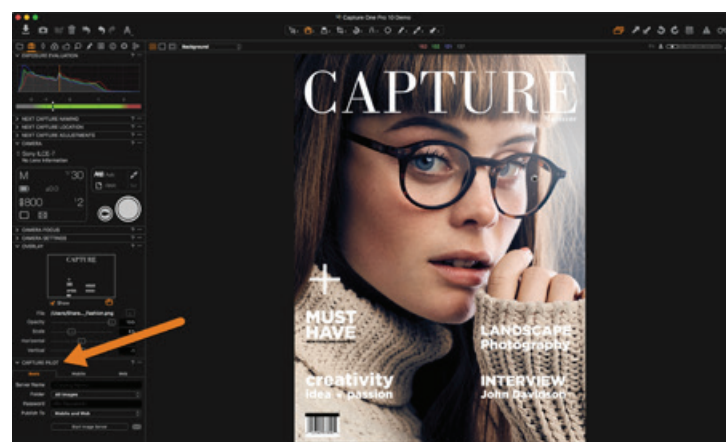
*Note: The overlay file should be a PSD, RAW, TIFF, JPEG or PDF. PC users can use a JPEG, TIFF, BMP, PNG or a GIF.*

## CAPTURE PILOT

Capture Pilot lets you present, rate and capture photos on an iPad, iPhone and iPod Touch directly from Capture One Pro software. The web function also provides additional means of viewing and rating from a web browser on another computer, Android device or any other hardware with a simple web browser.

Before you start: Download Capture Pilot from the Apple App Store. Capture Pilot requires local network Wi-Fi. Ensure your Capture One workstation and Capture Pilot device are on the same network as each other.

The Capture Pilot tool is located (by default) at the bottom of the Capture Tool Tab.



1) Connect your iPad, iPhone or iPod Touch to Capture One

a. Open Capture Pilot at the bottom of the Capture Tool Tab in Capture One Pro.

b. Add a Server Name and choose a Folder of images from the drop down menu that you want to appear in Capture Pilot

- c. Set a password if you wish
- d. Set Publish To to Mobile
- e. Press Start Image Server
- f. Now open the Capture Pilot app on your iOS device and select your named Server from the Server List.

2) Connect to a web browser

a. Open Capture Pilot at the bottom of the Capture Tool Tab in Capture One Pro.

b. Add a Server Name and choose a Folder of images from the drop down menu that you want to appear in Capture Pilot

c. Set a password if you wish

d. Set Publish To to Web

e. Select the Web tab, choose a theme from the drop down menu

f. Note the address given in Local IP and distribute to anyone who wishes to connect. Enter this address into any web browser to connect to Capture Pilot.

Note – To connect to both Mobile and Web, choose Mobile and Web in the Publish To menu.

Other Resources

<https://blog.phaseone.com>

<https://www.youtube.com/user/PhaseOneDK>

[www.captureone.com](http://www.captureone.com)

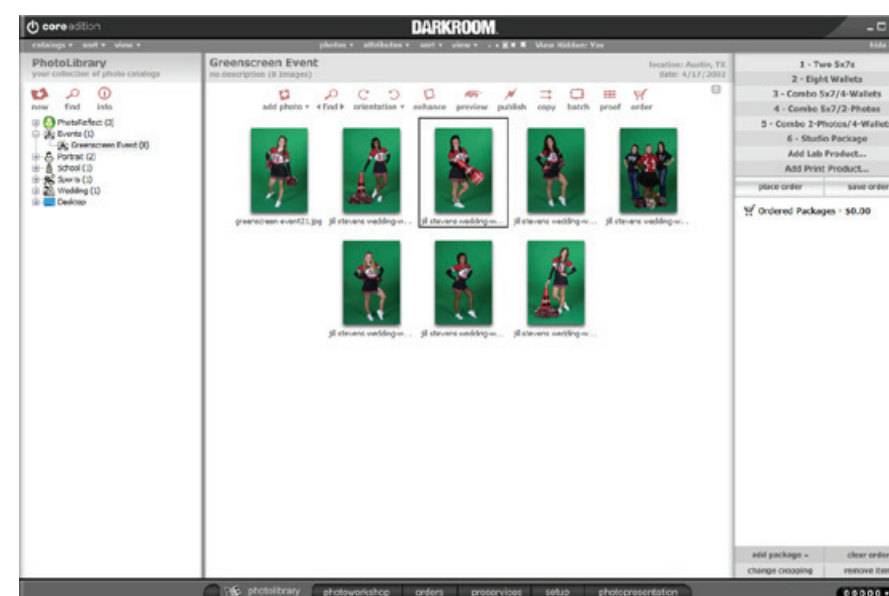
## DARKROOM SOFTWARE



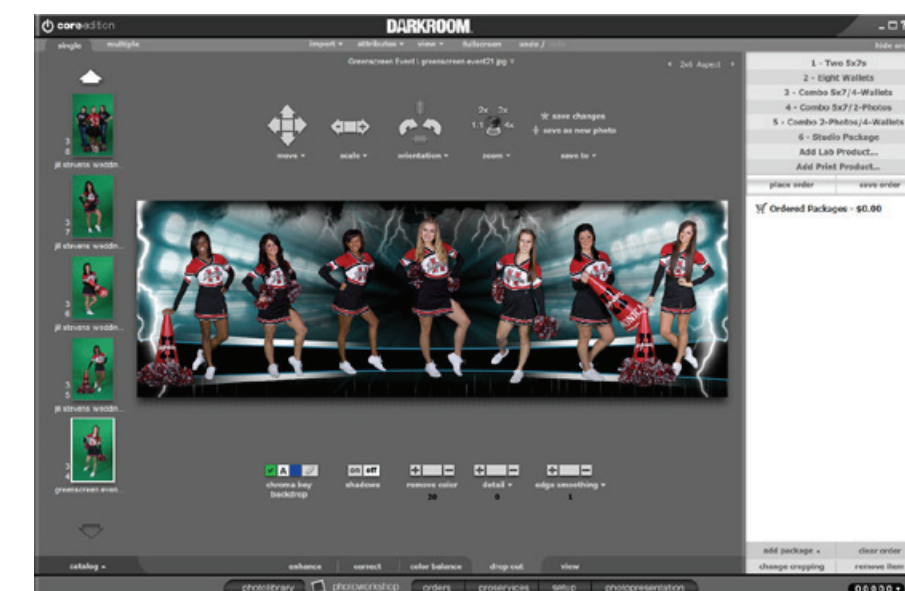
Darkroom Software is an end to end photography business workflow solution. Darkroom Software is ideal for on-site photography events where time and efficiency are key.

Whether you are taking and printing a few hundred pictures of children with Santa, or thousands of pictures at a sporting or corporate event, Darkroom can manage your workflow from capture, to graphics, layout, on-site printing, selling, and cloud based e-commerce. Among other features, Darkroom Software lets you:

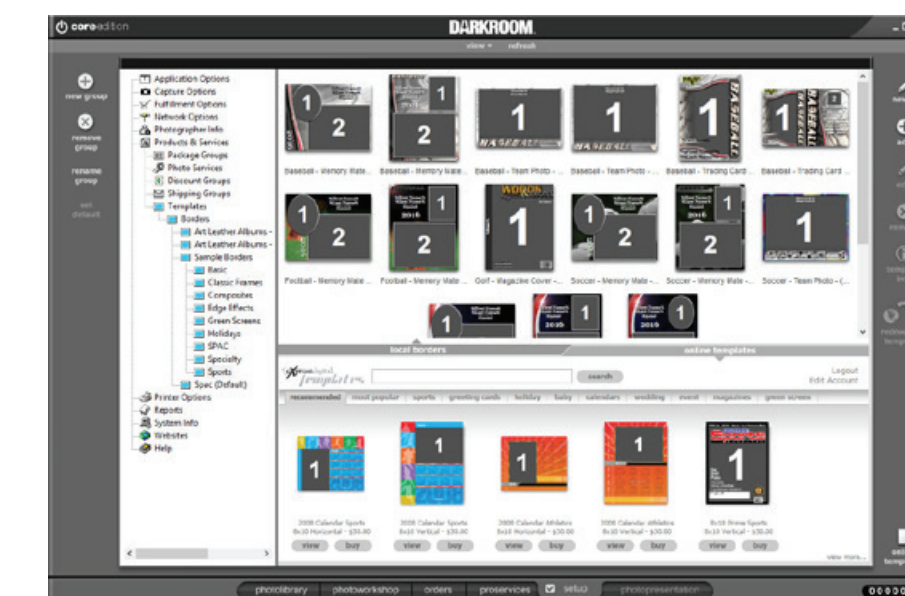
- Catalog and browse images in event based groupings



- Drag and drop images into pre-setup templates for fast chroma-key or regular prints
- Shoot tethered directly into pre-setup templates
- Connect directly by USB to most Canon and Nikon cameras as well as hot folder monitoring for wireless image import



- Select from multiple preset packages with multiple items for fast paced event printing
- Set up packages with pricing, invoice creation and reporting

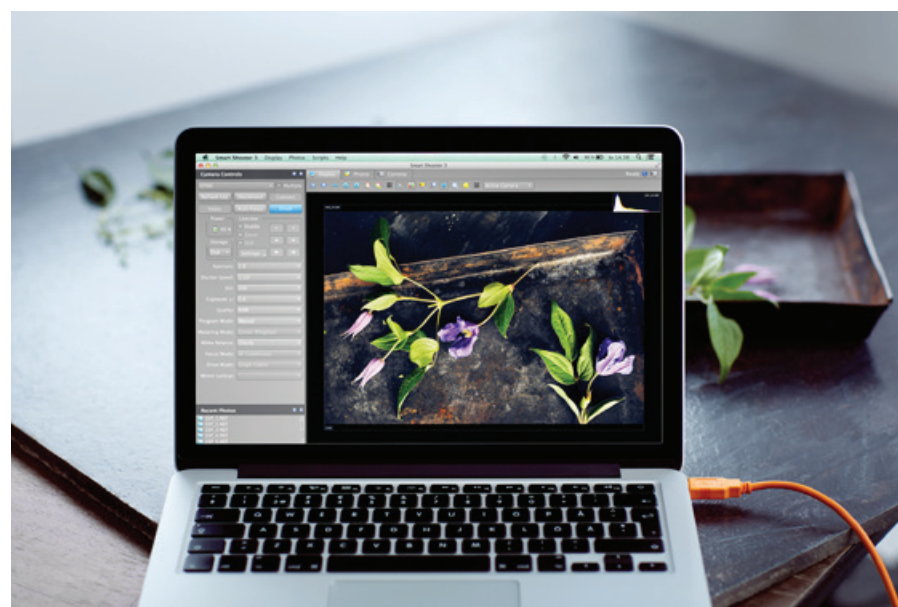


- Design with templates can be categorized and selected quickly
- Adjust templates for text input and data import to quickly customize output
- Support multiple printers with load balancing to speed output
- Work with various industry leading printers, with built-in drivers for simpler setup

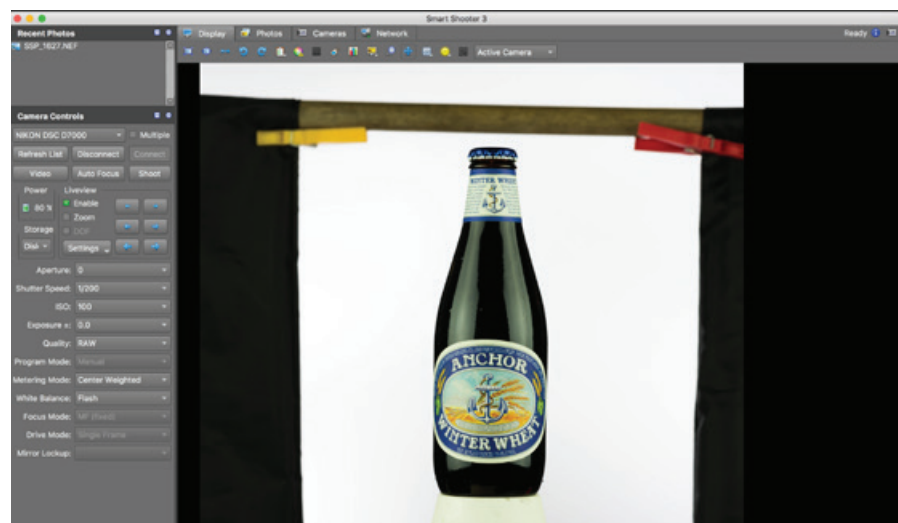
## SMART SHOOTER



Smart Shooter is a digital photography work flow application for tethered shooting, remote capture and advanced camera control.



Smart Shooter allows you to fully control your camera from your computer, giving you freedom to explore and experiment to help take the perfect picture. Automatic download and display means you can fully evaluate your photos in seconds, and real time live view output will help you focus and compose the scene. Scripting language lets you control your camera, allowing you to take multiple photos with varying settings just by clicking a single button.



Smart Shooter works with all recent Canon EOS DSLR and Nikon DSLR cameras, with both Windows and Mac OS X computers.



Smart Shooter is aimed at both the professional and amateur photographer, providing them with the following features:

- Remote camera control via USB cable
- Full control of camera settings
- Automatic photo download and display on you computer
- Real time zooming/panning photo display
- Live View display including overlay mode
- Bulb shooting with timed exposure
- JPEG and RAW file formats
- Connect and control multiple cameras
- Automatic control via scripting
- Barcode scanning/filenaming directly from photos

## MANUFACTURER SOFTWARE

Many of the camera manufacturers have their own tethering software. The list of software includes:

### CANON EOS UTILITY



Canon EOS Utility software is available free with Canon cameras and includes many of the features found in purchased software packages such as transferring and viewing RAW images or JPEG previews, rating and tagging images, remotely controlling the camera, displaying live view (if camera supports it) and other tethering functions. Available for both Windows and Mac, the initial EOS Utility installation requires the original software disk that came with the camera. Once installed, updates can be downloaded directly from Canon.



### NIKON CAMERA CONTROL PRO



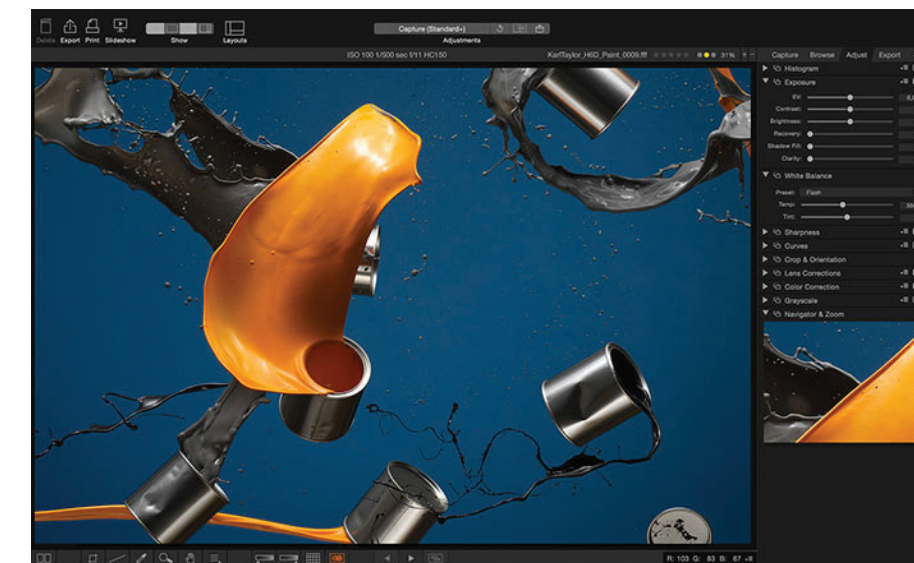
Nikon Camera Control does not come with Nikon cameras, but is sold separately and is a full-feature tethering software package that allows full control of all compatible cameras' settings. Available for Windows or Mac, Nikon Camera Control Pro software re-

motely controls most functions of Nikon digital SLRs from a computer that is connected via USB cable or wireless transmitter. Advanced functions including camera controls, live view function, and presets are also supported through the Picture Control System. It also offers the optional workflow of using Nikon's exclusive processing and editing applications, Capture NX and View NX.

### HASSELBLAD PHOCUS



Phocus is a free software package designed for processing Hasselblad RAW files and for tethering Hasselblad cameras via cable. Available for Mac and Windows, Phocus software offers common tethering features and remote functions, such as remote focusing, live view, exposure controls, and advanced processing features such as moiré removal, batch processing and camera calibration to name a few. Hasselblad also offers Phocus Mobile, which wirelessly integrates an iPad or iPhone into the workflow enabling users to remotely browse and rate images in a session when the camera is connected to the app either tethered to a computer or via wifi for enabled cameras. Phocus Mobile can be used for remote operation and triggering of a tethered



camera, control of exposure mode, f-stop, shutter speed, ISO, metering mode and other important capture parameters, all presented in a virtual camera display.

### SONY REMOTE CAMERA CONTROL

**SONY** Sony Camera Remote Control is a free software package for Alpha Series DSLR's that runs on Mac or Windows platforms. The program is available on the bundled software disc included with the camera purchase. Although limited in features, the software does provide access via USB cable to control some camera settings like shutter release and white balance control. Once the software is installed and up and running, there is a handy little [work-around](#) to tether a Sony Alpha into Lightroom or Capture One in order to access some more robust features.

Select sony cameras are also supported by capture one pro to offer more robust tethered capture features, digital asset management, extensive adjustment tools and a more flexible workflow for sony shooters. supported sony cameras can be [found here](#).

### 3RD PARTY SOFTWARE OPTIONS

The software covered so far represents the most popular options but not all cameras are supported by them. Plus, some other applications offer additional features such as multiple camera control, advance time lapse, hdr features and more, which you may find valuable. Tether tools keeps an up-to-date resource list of currently available tethering software that includes a brief description of each product. The following applications, in particular, may be worth exploring:

- Backyard eos
- Backyard nikonbreeze systems
- Camerarc
- Controlmynikon
- Darktable
- Digicamcontrol
- Dna software
- Entangle
- Fuji hyper-utility software
- Fuji-flim tethered capture plug-in for lightroom
- Kuuvik capture
- Olympus capture
- Pk\_tether
- Promote systems usb tether for lumix
- Sofortbild
- Tetherpro

[View your options here.](#)



#### TIP:

Even when shooting cabled into a computer software program, you can still wirelessly mirror the images from your computer to a tablet or smartphone for additional viewing preferences. Applications such as [Air Display](#) and [Capture Pilot](#) exist to help achieve your desired configuration.



Photo: Moshe Zusman

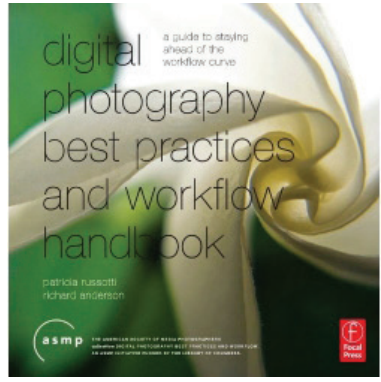
# FILE MANAGEMENT RESOURCES

One of the most important things you can do for your workflow is to create an organized file management system. This process of naming, storing and handling image files, coupled with smart metadata and quality archival software, can be the key to your success.

ASMP has compiled the industry's best resource for workflow file management on the dpbestflow website. Developed with funds awarded by the united states library of congress through its national digital information infrastructure and preservation program (ndiipp), the project was created to develop a public resource with guidelines for all creative professionals on best workflow practices in digital file management and archiving.

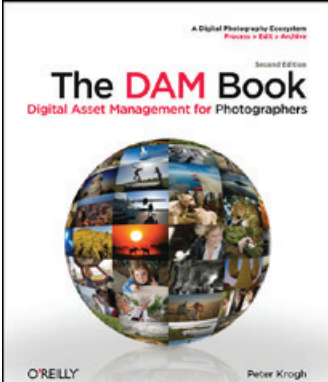
Tethered photography enhances the efficiency of your workflow – especially when paired with an effective file management system. We recommend reading the articles at each of the following links to ensure your personal file management system will withstand the test of time and a growing library of files:

### BOOKS



**Digital Photography Best Practices and Workflow Handbook** (Focal Press, 2009) by Richard Anderson and Patti Russotti. Richard Anderson was a key par-

ticipant in the initial creation of the dpbestflow project. The book presents workflow practices for planning, capturing and archiving digital photography.



**The DAM Book, 2nd Edition** (O'reilly Media, 2009) Author Peter Krogh was another key member of the original dpbestflow team. His book on digital asset management is an essential guide for photographers

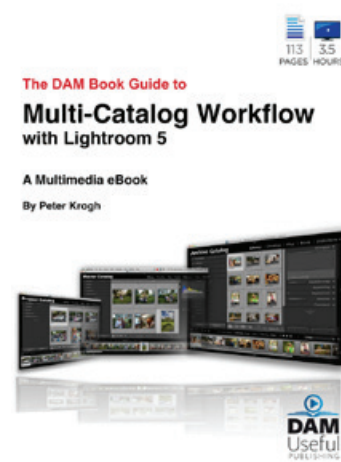
moving from film to digital and shows how all the components of a digital photo library fit together into a comprehensive system.

### GUIDES



**The DAM Book Guide to Organizing Your Photos with Lightroom 5** (Dam Useful Publishing, 2014) by Peter Krogh. In this multi-media ebook featuring 10 chapters and 7 hours of video, peter

krogh uses his own extensive image library to explain a simple theory of organization based on a three-step approach that will help you sort your image library, streamline your workflow and get your images out into the real world quickly and easily.



**The DAM Book Guide to Multi-Catalog Workflow with Lightroom 5** (Dam Useful Publishing, 2014) by Peter Krogh. Building on the principles first laid out in the dam book, this 113 page multimedia guide establishes the principles of solid multi-catalog work-

flow, defines the terminology necessary to understand the process and shows you the workflows in action. Packed with more than 3 and a half hours of videos and clear step-by-step lists, it will help intermediate and advanced lightroom users create clarity in their workflows.

### ARTICLES:

- [File Management Overview](#), written by Richard Anderson & Peter Krogh
- [Directory Structure](#), written by Richard Anderson & Peter Krogh
- [File Naming](#), written by Richard Anderson





## TETHERING WITH CABLES

**T**raditional tethering is the process of connecting a cable from camera to computer and transferring images immediately while shooting. Depending on the equipment you're using, your shooting style and your needs, you may prefer wired or wireless tethering. This chapter will focus on wired tethering, (where a cable physically connects your camera to your computer or device) and the specific process of choosing the right cable and set up for your tethered photo shoot. Chapter 6 will address wireless options.

### IMPORTANT CONSIDERATIONS

Critical factors for selecting the right cable for the job include protocol, compatibility between the camera and computer or tablet, reliability, speed, length and security. Photography requires a tremendous amount of data to be transmitted and speed is critical, therefore tethering cables should be designed to the highest specifications.

Any interference with the transfer of your images between your camera and storage device can cause corruption or data loss so look for cables that are fully shielded to protect against external interference, noise and transmission errors. Be sure your tethering cable has heavy cable insulation and interior braiding as well as strong port casings and connectors to minimize issues.

### BASIC CABLE CARE

Properly coiling cables and using cable cases for storage and transport will dramatically extend



the life of a cable. To ensure cables perform at optimal quality, protect them from being stepped on or tripped over. Don't place stands on top of them and avoid rolling carts over cables. Connectors are one of the most fragile parts of your cables so avoid jerking them while tethered or when disconnecting the cable from your camera or device. Later in this chapter, we'll outline how to properly secure cables and protect ports.



**TIP:** [Want your cables to last longer? Here's a link to 5 Tips on how to properly care for your tethering cables.](#)

### SELECTING THE RIGHT CABLE FOR YOUR CAMERA

Most cameras include an HDMI port and a Fire-Wire and/or USB port. Today, USB is the most

For best results, use USB cables and extenders that are the same protocol as your camera. If your camera is USB 2.0 hi-speed, use USB 2.0 hi-speed cables and extenders all the way through, even if your computer uses USB 3.0. The computer will recognize the USB 2.0 protocol and convert the signal properly at the end. Mixing USB 2.0 and USB 3.0 cables can cause an increased drop rate resulting in data loss.

If the camera is USB 2.0, that will be the maximum speed transfer rate, even if you use faster cables as speed is dictated by the slowest device in the chain. If you experience signal loss issues at any USB speed, adding an externally powered USB booster like the TetherBoost Pro USB 3.0 Core Controller can help alleviate challenges with mixed USB protocols.

commonly used transfer protocol for tethering because of its quick and reliable data transfer properties. FireWire is traditionally used with Digital Backs and some older DSLRs.

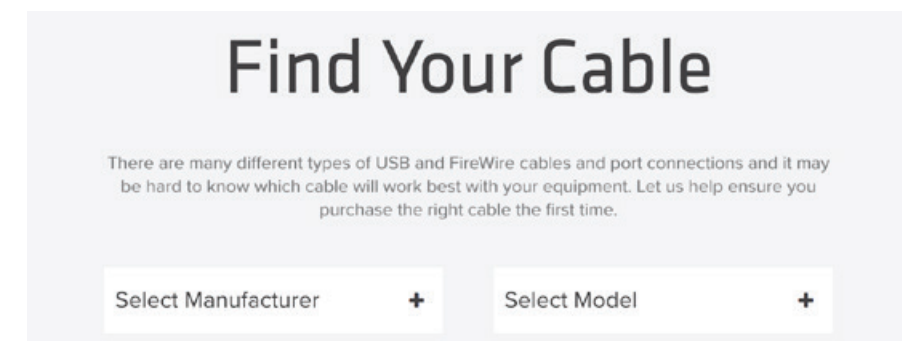
HDMI is popular for mirroring the camera's rear display to a larger monitor or when working with video files, but it does not offer the image portability needed to transfer data into a tethering software program.

It is important to determine if the camera has USB 2.0 Hi-Speed, USB 3.0 SuperSpeed and/or a Fire-



Wire port, and to identify the pin count and configuration of your port, for example 5-pin, 8-pin, mini, micro, etc. Tether Tools keeps a comprehensive cable type and compatibility resource on its website for reference.

Find the right cable for your camera with [Tether Tools' Cable Finder](#).



## CABLE LENGTH

The optimal base cable length for most tethered shoots is 15ft. (4.6m), an industry standard. This length allows for a reasonable amount of movement without feeling too constrained. If a greater distance between camera and computer is desired, Active Extension USB cables or FireWire boosters can be used to extend the length. It is not recommended to use a single cable that's longer than 15 ft (4.6m). Moving your data from one end of a longer cable to the other without an Active Extension booster increases the chance of signal noise and transmission errors. By using a 15 ft (4.6m) base cable with the proper extensions and boosters you can achieve longer distances without sacrificing speed or signal strength.



### NOTE:

Adding distance with USB cables can vary depending on the USB Protocol your camera uses. Read below for specific tips on achieving a consistent signal at longer cable distances.

**VIDEO:** How to set up a tethered connection from your camera to your computer

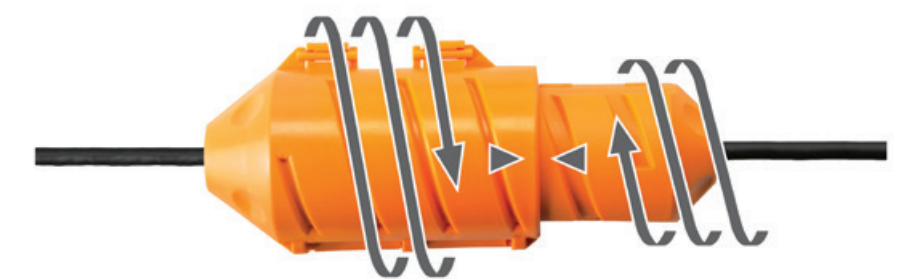


## USB 2.0 HI-SPEED CABLES

For USB 2.0 Hi-Speed protocol you have the option of “daisy-chaining” Active Extension cables out to a maximum of 80 ft. (24.4 m). To achieve that length, you'll have to use one base cable and then add on multiple Active Extension cables, which can each be up to 16' long.

Rather than connecting the USB Male A plug coming out of your camera directly into the computer, you would plug into a signal booster attached to another 16 ft. of cable. The extension cable is then plugged into your computer. If you use high quality shielded Active Extension cables such as the TetherPro 16-ft Active Extension cables, you can add up to 4 cables, for a total of 80 ft. without experiencing any signal loss or interference.

Active Extension Cables are required every 15 ft (4.6m) in a tethered session. Protect the connection with a case such as the [JerkStopper Extension Lock](#).



## USB 3.0 SUPER SPEED CABLES

The USB 3.0 Super Speed protocol can transfer large files faster than USB 2.0 but requires more power and cannot achieve as long a distance.

Extending USB 3.0 cables beyond 15-30 ft (or the equivalent of one 15-ft base USB 3.0 cable plus one 16-ft Active Extension cable) can cause the computer to drop the camera connection.

Because of the additional power requirements, and inconsistencies within the newer USB 3.0 firmware deployed by camera and computer manufacturers, optimal transmission speeds and consis-

**VIDEO:** Determine if your tethered connection requires a TetherBoost Pro USB 3.0 Core Controller



tent signal/data transfer are only achieved when using a powered booster such as the [TetherBoost Pro USB 3.0 Core Controller](#). This is recommended whether you're using just a base 15-ft cable or a base 15-ft cable plus multiple 16-ft active extension cable configurations. For more on this topic, read this helpful article: [Why Does My USB 3.0 Connection Fail?](#)



TetherBoost Pro USB 3.0 Core Controller

## FIREWIRE CABLES

FireWire cables are also a standard protocol cable option compatible with select cameras. Chapter 7 features a special section on shooting with digital backs and medium format cameras, where FireWire ports are most commonly found.

## USB-C CABLES

Apple's latest announcement that their MacBook Pro line will have only USB-C port connections is a very exciting development as USB-C will bring faster speed and more robust power solutions to the marketplace. At the time of this writing, the majority of camera manufacturers have USB 2.0 and USB 3.0 ports in their cameras and as such, there is no real advantage to using a USB-C cable. While there are many benefits to the USB-C protocol, owners of existing USB2 and USB3 cameras will not see an increase in speed or performance. It is our recommendation that if you have, or are considering purchasing, a computer equipped with only USB-C ports that you use the USB-C to USB-A adapter.

## SECURING YOUR CABLES & CAMERA

One of the most common challenges of tethered shooting is ensuring that movement on the set does not interfere with cable connectivity. Most camera cable ports are fairly shallow and do not lock the cables into place. As a result, cables can lose connection and even fall out quite easily. Add in the photographer's need to move quickly and the very real possibility of people accidentally tripping over or stepping on cables and you can wind up with frequent disruptions and lost data.

There are three major connections that can be affected – the camera port, the computer port and



JerkStopper Camera Support

if using an active extension cable or booster, the mid-point connections. Each of these connections can be secured with a simple tool.

Cable retention devices, such as the Tether Tools [JerkStopper Camera Support](#), [Computer Support](#) and [Extension Lock](#), protect each port by anchoring the cable so that any pressure from jerks or pulls is shifted away from the cable port itself. Cable retention devices also ensure the plug stays connected at all times. Taking this precaution pro-

fects you from costly disruptions and data loss, not to mention hundreds if not thousands of dollars in preventable cable and camera port damage.

## SETTING UP A CABLED TETHERED WORKSTATION

It's easy to create a streamlined tethered setup that meets your needs for every imaginable situation:

- Transferring images to a desktop, laptop or tablet
- Shooting handheld or on a tripod
- Working in studio or on location
- Working solo or sharing images with assistants, subjects and clients

Here are a few common set ups that work well for the majority of photo shoot scenarios but don't let these limit your imagination. Whatever your shooting situation, you can find mounting solutions that will help you tether easily and efficiently.



Photo: Douglas Sonders



check your images during the shoot. This is key to achieving an efficient tethered work station that fosters communication with those on set.

A portable laptop table that can be mounted securely on a tripod or stand, such as the Tether Table [Aero System](#), will allow you to create a lightweight workstation that can easily be adjusted to a convenient height for comfortable use on location or in studio.

Rolling wheels can offer added mobility. Be sure to select a table that's large enough for your needs. You may also wish to consider a [cooling pad](#) for your table – in addition to preventing overheating, the non-slip surface helps keep your laptop secure and protects the table from dings and scratches. It's smart to invest in [security straps](#) that will keep your laptop in place if bumped or tipped.

If you are backing up images to a hard drive during your shoot (as recommended in Chapter 8, you'll want a system that supports your back up drive securely, keeps loose cables under control and keeps it out of your way. A compartment that attaches underneath the laptop table, like the [Tether Tools XDC External Drive Compartment](#), provides an ideal solution.



Adding a crossbar, such as the Rock Solid Tripod Cross Bar, allows you to use the same tripod to support both your laptop and your camera. This is beneficial when you have a small footprint to

place your gear at a shoot, such as product photography or step and repeat event photography. Having the ballhead on top of the crossbar also offers a convenient place to put your camera during breaks from handheld shooting.

If you prefer to mount your laptop to a C-stand, you may want to consider a [side arm](#) so you can mount your table to the center column and still be able to mount camera, lights, monitors or other peripherals on top of your stand.

When shooting tethered in bright conditions it is often hard to see the screen clearly. Adding a

sunscreen for your laptop such as the [Think Tank Pixel Sunscreen](#) can help with glare issues. The Pixel Sunscreen design is ideal because the over-the-head shade blocks out most all light, allowing you to see the screen clearly. The openings on the side allow the tether cable and hard drive connector cable to exit the sunscreen on each side of the laptop. The side openings also allow a Secure Strap to attach to the table, holding down both the laptop and Sunscreen. Should a gust of wind catch the sunscreen, the laptop will still be securely attached to the Tether Table.

**TETHER TOOLS**

## The Ultimate Workstation



### FEATURED PRODUCTS:

- 1 Case Air Wireless Tethering System
- 2 RapidMount Accessory Extension Bar
- 3 Aero XDC
- 4 Aero ProPad - Traveler
- 5 Tether Table Aero - Traveler
- 6 Aero Cup Holder
- 7 Secure Strap
- 8 Aero Marketing Brochure Holder
- 9 Aero Clip-on Hook
- 10 TetherBoost Pro USB 3.0 Core Controller
- 11 TetherPro USB 3.0 Cable Micro-B 5-Pin
- 12 JerkStopper ProTab Cable Ties - Small
- 13 Rock Solid External Battery Pack (10,000 mAh)
- 14 StrapMoore
- 15 Rock Solid Tripod Roller
- 16 Rock Solid Master Clamp
- 17 Rock Solid Master Articulating Arm
- 18 AeroTab Universal Tablet System
- 19 Rock Solid Tripod Cross Bar

### RECOMMENDED ACCESSORIES:



JerkStopper  
Camera Support\*  
\$ 16.95 (SKU: JS020)



JerkStopper  
Clip-on Support\*  
\$ 9.95 (SKU: JS022)



JerkStopper  
Extension Lock  
\$ 8.99 (SKU: JS026)



Photo: Tether Tools

## WIRELESS TETHERING

In today's digital environment, there are more and more options to integrate wireless technology into our daily lives and work. That also holds true when discussing tethered photography options. The definition of tethering as we've outlined so far in this guide has related to using cables and software to capture RAW or JPEG image files directly to your computer's hard drive. Advancements in wireless image transmission have broadened the definition of tethering. While many of the same benefits of cabled tethering can be achieved with wireless transmitters, there are still significant differences in the image file transfer aspects of "wireless tethering".

In this chapter, we'll outline the benefits and limitations of wireless tethering and how they compare to tethering with cables so you can decide which approach will work best for your business and your clients. Depending on the range of work you do, it may make the most sense to use cables for some shoots or clients, and tether wirelessly for others.



Case Air Wireless Tethering System

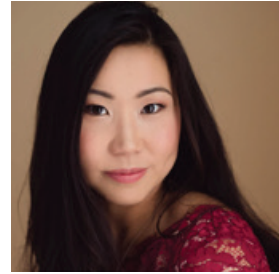
### WIRELESS TRANSMISSION

Wireless transmitters vary much more widely in their functionality than cables. This is specifically because each transmitter has its own proprietary receiving application and/or file structure depending on each brand's transmitter. These differences, charted on page 40, introduce key points to consider when deciding if wireless tethering is the right option for you.

First, not all wireless devices are able to transfer RAW files. For those that do transfer RAW, as of this writing, the standard Wi-Fi protocol (Wireless N) is just too slow to transfer the larger RAW files without unacceptable delays.

Secondly, you'll want to think about the impact of wireless tethering on camera batteries. Unlike tethering with a cable where battery impact is negligible some wireless transmitters can be a substantial drain on the camera's batteries.

As outlined in the next section, there are several different types of wireless transmitters used for tethering. Built-in wireless and many manufacturer-specific transmitters use the camera's internal batteries so if frequent battery changes are too disruptive for your working style, they may not be a good solution for you. Other transmitters have their own built-in battery but those add bulk and weight as well as another battery/charger to manage. These trade-offs are all worth serious consideration.



## WIRELESSLY TETHERING AT A CORPORATE EVENT WITH THE CASE AIR

Photos and Written by Nicole Chan

I have a photographic style that is a mix of documentary and beautiful, casually posed portraits. I was recently hired by a corporate client, Pepsi, to capture New England Patriots quarterback Tom Brady with 250 guests.



This is a large event for PepsiCo's top level management as well as the one corporate event that Tom Brady attends and speaks at. The event organizers wanted approximately 250 people to be able to have a photo taken with Tom Brady and then have their photos instantly printed, inserted into a branded photo sleeve, and then distribute to the attendees within minutes. The printing and sleeve station must be on the 2nd floor, about 200 feet away from where the photos were taken. The time we had with Tom Brady was short, as well. The location and time constraints added pressure.

Instead of running a 200 foot USB connection, or using assistants with SD cards, I opted instead to use the new Case Wireless Tethering System from Tether Tools to wirelessly connect my camera to an Asus laptop and DNP printer.

### Here's my full setup:

- Canon 5D Mark III
- 24-105 f/4
- Einstein light with umbrella
- Pocket Wizards
- Tether Tools Case Air Wireless Tethering System
- DNP printer
- Asus laptop

Since the event coordinators wanted the photos printed and delivered immediately, tethered was the only way to go. I have an extremely long USB cable that could have made it from the area I was shooting to the printer, but securing it down with gaffers and running it up to the 2nd floor wasn't something I wanted to mess around with.

I had heard unhappy stories of previous photographers working this event. They shot 10 to 15 groups and then had an assistant run the SD card up the stairs to where the printers were. It seemed disorganized and left many opportunities for error. While I have no doubt that my assistants Jarrett and Jason are excellent sprinters, I wanted to keep this running-cards-up-and-down strategy as a backup option.

The Case Air performed smoothly and excellently, I wish I had discovered it earlier for any commercial, portrait, and advertising work where I am working with a team. I think real-time feedback is excellent so that I can communicate with my team on likes, dislikes, and modifications.



The [Case Air Wireless Tethering System](#) connects to the camera through the USB port. It creates its own wireless connection between the camera and a phone, tablet, or computer application that is receiving the images.

### HOW WIRELESS TETHERING DEVICES WORK

Wireless transmitters are designed to send data from one device to another without cables in between. Some wireless tethering devices require you to be hooked up to an existing wireless network to transfer data. Existing wireless networks are often more robust as they are designed for many devices using the same network.

Other wireless transmitters actually work as ad-hoc networks, creating the connectivity directly between camera and device without needing an existing network. Ad-hoc networks allow use of your wireless device in remote locations where no existing wireless network can be found.

Wireless tethering transmitters can typically send images to any computer/laptop, iPad, tablet or phone. The most common are devices running iOS, Android, Mac and Windows operating systems.

### WIRELESS TRANSMITTER OPTIONS

It is important to note that while there are differences in cable quality, speed, build and signal reliability which can affect a tethered shoot, all cables are technically designed to work the same way, given the same camera and computer/software set ups. Wireless transmitter manufacturers, however, use a variety of different technologies and each has its own proprietary software or application that receives the information being transferred. These differences in transmitter type and applications create large variances in what wireless transmitter systems can do for you. Here are the most common types for DSLR, mirrorless and Medium Format cameras.

1. DSLR Built-In, Plug-In and Wireless Cards
2. Camera Manufacturer Solutions
3. Non-Proprietary 3rd Party Wireless Solutions
4. Medium Format Digital Back Wireless Built-In Transmitters.

Each of these transmitters typically sends images to an application or folder on either an iOS, Android, Mac or PC device (not all operating systems are supported by all devices). Beyond that their set up and available functions vary depending on the type and brand you choose.

The following pages provide more detail for each of these options. As you read further, keep in mind that your preferred workflow and the needs of your clients should be your most important selection criteria.

### DSLR BUILT-IN, PLUG-IN AND WIRELESS CARDS

At the time of writing, DSLR Built-in, Plug-in and Wireless SD Cards make it possible to send im-

age data wirelessly to a smartphone or tablet. All of these tools support image transfer to a simple photo app such as your camera roll that will allow for minor edits, social sharing or emailing the image.

Built-in and Plug-in devices usually do not transfer raw images, nor do they connect to software with processing, rating or zooming functions. These tools are designed primarily for sharing purposes to a phone or tablet photo album or camera roll.

In this way, these tools are similar to Wireless SD Cards, which have a small internal transmitter that let you send images wirelessly for social sharing purposes or post-shoot uploading without removing the card from the camera. The JPEG images are actually transferred and are saved in the device's camera roll until they are uploaded elsewhere or deleted.

Some Wireless SD Cards can transfer RAW images to personal device camera rolls or to a designated folder on a computer. The device to which the image is being transferred will determine whether it is feasible and desirable to move large image files wirelessly. "Camera Rolls" on phones and tablets have lower storage limits so sending smaller image files such as a JPEG instead of RAW is preferable. Wireless SD Cards have relatively small wireless transmitters and it may take a long time for each image to transfer to the device of choice.

Check your camera manual to determine your built-in wireless support. To achieve higher-level functions like zoom, rate, tag and two-way camera control functions, live-view, HDR, etc., you'll want to look at the Camera Manufacturer Solutions, Non-Proprietary 3rd Party Wireless Solutions and Medium Format Digital Back Wireless Built-In Transmitters outlined below, all of which offer more robust features.

## CAMERA MANUFACTURER SOLUTIONS



To achieve the more robust features found in wired tethering workflows, DSLR shooters need to attach external transmitters to your camera. These may be made by your camera manufacturer or a third party.

This section focuses on attachable transmitters made by camera manufacturers. We cover third party transmitters in the next section.

Typically, camera-manufacturer attachable transmitters are designed to send images to an FTP server or computer. Once an FTP connection is completely set up, the connection sends RAW or JPEG files directly into the chosen server. (Note: RAW file transfer is going to be a slower process than JPEG, especially if sending to an FTP server rather than directly to the computer.) The set-up for these solutions tends to be a little more technical and requires some knowledge of working with an IP address and FTP configuration. Refer to the device's manual for set up options and instructions as each one varies.

Once set-up, manufacturers' attachable wireless transmitters offer Live View and Camera Control through a computer or portable device such as a tablet or phone.

Most of these devices are camera-model specific so if you have multiple camera bodies, multiple transmitters may be needed. Keep in mind, too, that most of them run off of the camera's battery,

so you will want to have plenty of back up batteries as you may need to change batteries more often during shoots.

## NON-PROPRIETARY 3RD PARTY WIRELESS SOLUTIONS

Third party wireless tethering systems like the Case Air Wireless Tethering System are designed to be compatible with multiple camera manufacturers and various models. These systems typically focus on Nikon and Canon DSLR camera models.

Third party systems send images directly to an application on your phone, tablet, or computer. Most offer plug and play solutions that are easier to set up than an FTP connection and support many pro level features including camera setting controls, liveview, timelapse, HDR, shutter control, and more.

These solutions, like the Case Air, create an ad-hoc network connection between your device of choice and camera and are compatible with mobile (iOS and Android) and laptop and desktop computers (Mac and Windows). These transmitters allow JPEG files to be sent directly to the devices of choice while retaining the original JPEG or RAW file on the camera card.

## MEDIUM FORMAT DIGITAL BACK WIRELESS BUILT-IN TRANSMITTERS

Many Medium Format Cameras/Digital Backs offer built-in wireless transmitters with more robust functions than typical DSLR built-in wireless transmitters. They come with their own feature-rich applications which include rating, tagging, editing and sharing options. They are also capable of two-way wireless communication which allows for adjusting camera controls and triggering from the connected device. Learn more

about the two most popular medium format built-in wireless options: [CapturePilot \(PhaseOne\)](#) and [Phocus Mobile \(Hasselblad\)](#).

## CONNECTING TO MULTIPLE DEVICES

Some wireless transmitters allow you to connect your camera to multiple devices for image transfer. Check the device's features and manual to set this up properly for your device. More commonly, certain DSLR and Medium Format cameras offer the ability to connect a portable device such as tablet or phone into a cabled tether session running on a host capture laptop or computer.

This approach allows a client or assistant to re-



view and rate images on the mobile device while the files are transferring via cable to a computer. The mobile device can also be used to control camera settings and trigger the shutter remotely.

Hasselblad's mobile application for this process is called Phocus Mobile. Phase One/Mamiya Leaf uses Capture Pilot. Capture Pilot can also be used in this way with any Camera supported in Capture One. This is a very convenient and a powerful tool as you can technically be shooting in a location that does not have any access to WiFi networks, and still be using a tablet or phone for capture and review.

	iOS	Mac	Android	PC/Windows	FTP	DSLR/MF	Proprietary
CamRanger	x	x	x	x	x	DSLR	No
iUSBport Camera	x	x	x	x		DSLR	No
Case Air	x	x	x	x		DSLR	No
Weye Feye	x		x			DSLR/ Mirrorless	No
Attachable transmitters	x	x		x	x	Varies by Camera Manufacturer	Yes
Built-In Pro camera models	Varies by camera	Varies by camera	Varies by camera	Varies by camera	Varies by camera	Camera specific	Yes
NOTE: These options and features are always changing so please consult each manufactures specifications for latest features.							

## SHOOTING WIRELESS INTO YOUR CATALOG WITH WATCH FOLDERS

When shooting wirelessly to a computer or laptop, your images will be transferred to the proprietary application associated with your wireless device. However, if you would like to shoot wirelessly and import your images directly into your favorite catalog software program, you can set up a simple workaround.

Most catalog applications, including Lightroom and Capture One, come with a functionality called “Watch Folder” or “Hot Folder.” This functionality has the effect of telling your catalog software to watch a certain folder on your computer and to automatically “pull” any images received in the Watched Folder into a specified folder in your catalog.

By setting your capture folder up as a Watch Folder (or Hot Folder) in your catalog application, your wireless captures will be imported into your catalog automatically.

## SETTING UP A WIRELESSLY TETHERED WORKSTATION

To ensure your wireless tethered shoot runs smoothly, be sure to follow these important steps.

Make sure your wireless transmitter batteries, camera batteries, tablet and/or mobile phone are fully charged before your shoot.

Plan to have back up power source like a [Rock Solid External Power Bank](#) or back up batteries on hand in case your batteries run down.

Have a backup tethering cable available in case the wireless device does not function as needed or the Wi-Fi signals are jammed or unavailable.

Create a set-up that keeps your viewing device conveniently accessible and secure. The optimal set-up will depend on whether you plan to use a computer, tablet or phone and the make or model of the device. You may want to consider investing in a specialized mounting system for your laptop, tablet or phone that can securely attach to your tripod or stands and that will keep your devices safe and within easy reach.





Photo: Anders Espersen

## WORKING WITH MEDIUM FORMAT

**M**edium format digital backs and cameras have somewhat different requirements than DSLRs. We've invited Danish photographer, Anders Espersen to share his insights on what you need to know when shooting tethered using medium format systems.



### MEDIUM FORMAT DIGITAL BACK TETHERING

Written by Anders Espersen

Medium format digital cameras have used tethering since the first commercial digital back from Leaf was introduced in 1991. In fact, for many years, until digital backs and cameras started using memory cards, tethering to a computer was the only way to view and save digitally captured images. Even today, with the added versatility, speed and ISO range of medium format digital cameras (such as Hasselblad, Phase One and MamiyaLeaf), tethering is still the preferred way to shoot for many photographers who use these camera systems both in studio and on location.

#### ADVANTAGES OF MEDIUM FORMAT CAMERAS

A medium format digital camera is slower and heavier to work with than most DSLR systems but in return offers much greater image quality, resolution, control and creative performance ability.

The fact that the medium format full-size CCD and CMOS sensors are more than twice as large as

a full frame 35mm CMOS sensor makes for higher resolution, higher dynamic range and more clarity in the final files. This, along with equally larger and predominantly high-performance lenses, helps ensure generally superior image quality across the different brands of medium format cameras.

For me, shooting with a medium format camera encourages me to stop and think before I shoot. The system simply requires you to work in a more controlled way and the final result shows that extra care. If you haven't picked up a medium format digital camera and looked through the viewfinder, you should! Comparing the viewfinder of, say, a Hasselblad H5D with a DSLR, is like going to an IMAX theater and then watching a movie on your iPad. Viewing the scene through a Medium Format camera lets you see everything much more clearly, compose your shot more accurately and work with a level of refinement that cannot be easily achieved using the smaller viewing field of a DSLR.

Besides that, there is the “he or she’s a pro” factor with your clients. You stand out from the crowd – you differentiate yourself and make your clients feel they get more value for their money, which of course they do!

## MODES OF CONNECTIVITY AND SOFTWARE SOLUTIONS

Connecting a digital back or medium format digital camera to the computer has, for many years, been restricted to using the FireWire standard, simply because this has offered the highest and most stable data throughput. USB 2.0 has never really been considered an option due to its significantly slower transfer speed. With the introduction of USB 3.0 and the gradual discontinuation of FireWire, we have seen USB 3.0 connections appear in, for example, Phase One IQ and Leaf Credo digital backs. With RAW file sizes of up to 80mb, a fast and reliable connection is naturally required.

Unlike the DSLR market, where there are a number of both proprietary and third-party software solutions for processing and capturing images, digital medium format cameras for the most part rely strictly on proprietary software solutions. This is because the camera manufacturers want to secure the best possible image quality for their platform and not rely on third-party software that might deliver sub-standard results. Another reason is that they are able to implement specialized features for their own systems such as accurate lens corrections, noise suppression algorithms, highlight recovery and a range of other sensor and camera specific solutions that other providers haven’t done.

Adobe Lightroom is able to read and process most of the files from Hasselblad, Phase One and MamiyaLeaf cameras but it is not currently capable

of establishing a tethered connection. The only medium format camera supported for tethered capture in Adobe Lightroom is the Leica S. It’s worth noting that Leica does not supply its own RAW processing software with the camera, but does provide capture software called Image Shuttle that offers greater camera controls. Should you prefer to use Adobe Lightroom as your processing software for any of the other medium format cameras, it is possible to shoot tethered using the manufacturer’s proprietary capture software and set up a Watched Folder structure that allows Adobe Lightroom to pull the images from there.

## WORKING WITH HASSELBLAD AND PHOCUS

The Hasselblad H-system uses the FireWire 800 9-pin standard to connect to a computer running Hasselblad Phocus software. The Hasselblad system offers two different file formats. A lossless compressed RAW format called 3FR used when shooting to CF card and another format called 3F for importing or shooting tethered. The 3F file offers the advantage of embedding all of the information in regards to previews, metadata, lens corrections, adjustments, etc., into the file so you can move 3F files onto another machine running Phocus and maintain all of the adjustments made to these files.

As mentioned in Chapter 6, Phocus is a capture and RAW processing software dedicated to supporting files off the Hasselblad digital H-system cameras. When tethering, Phocus gives you full control of the camera’s functions and programming options. You can even specify detailed user presets directly from the software and then store them in the camera.

Advanced controls such as Live Video with overlay – for lining up the shot – and focus adjustment makes this a powerful tool for the tethered shooter.

For photographers requiring precision multi-shot capability to achieve extra-large files with exacting detail, Hasselblad offers a couple of multi-shot cameras, the Hasselblad 4-shot H5D-50MS and 6-shot H5D-200MS. For those particular camera models, the Phocus software allows you to choose between single and multi-shot modes and also gives you instant feedback if any movement was detected during capture.

## WORKING WITH PHASE ONE OR MAMIYA LEAF AND CAPTURE ONE

The latest models from both Phase One and Mamiya Leaf, the Phase One IQ series and Leaf Credo, offer the option to tether using either FireWire 800 or USB 3.0. While the FireWire cable must connect to a (now less common) FireWire computer port, the USB 3.0 cable has a Male A end and can connect to either USB 2.0 or 3.0 computer port, making these digital camera backs more versatile in terms of tethering to connect to modern computers.

## CAPTURE ONE CAMERA INTERFACE

Although Phase One owns both companies, their digital backs offer different features and functionalities. But, the common ownership shines through in that both products utilize the same capture and RAW processing software, namely Phase One Capture One, and offer the same proprietary file formats: IIQ L, which is an uncompressed 16-bit RAW file, and IIQ S, which compresses the RAW data to provide a smaller file size.

Capture One works by either creating a Session, keeping all of the relevant files in one single folder structure, or by creating a Catalog (much like Adobe Lightroom). As noted in Chapter 3, the Session set up is optimal for tethering. Either way, information about adjustments and previews are

stored in a sidecar file. For those concerned about the sidecar getting separated from the RAW capture, Capture One gives you the option to export an “Enhanced Image Package” or EIP file, which packages the RAW data and associated sidecar into a single unit. EIP files can only be opened in Capture One.

When used with the Phase One and XF camera bodies, for example the new XF camera system, both the IQ and Credo backs offer full control of the camera system in relation to settings, exposure control, focus adjustment and Live View, etc., giving you immense control of the workflow and shooting conditions.

Hasselblad Phocus and Phase One Capture One both run on Mac OS and Windows machines. See Chapter 3 in this guide for detailed instructions on setting up a tethered session using Capture One.

## SECURING A STABLE CONNECTION

Regardless of the medium format digital camera or back you are using, connecting it to a computer for tethered shooting is relatively simple and easy. On Mac OS, it is simply “plug and play” and on Windows machines the installer takes care of installing the relevant drivers needed for the camera to establish a connection. There are, however, a number of possible obstacles on your way to a 100% stable connection.

## USING FIREWIRE

On newer Macs, where the FireWire port has been omitted, you will have to use a Thunderbolt to FireWire adapter. If you have any issues transferring files through your FireWire Adapter, you may want to use a FireWire800 repeater/hub. Keep the repeater/hub close to the computer in the cable connection chain.

Because of the large file sizes produced by medium format digital cameras, cable quality is crucial. Invest in the highest quality cables that are fully shielded to protect against external interference and transmission errors. Make sure your FireWire cables comply with IEEE 1394b specifications, which will make them backwards compatible with existing [FireWire technology](#).



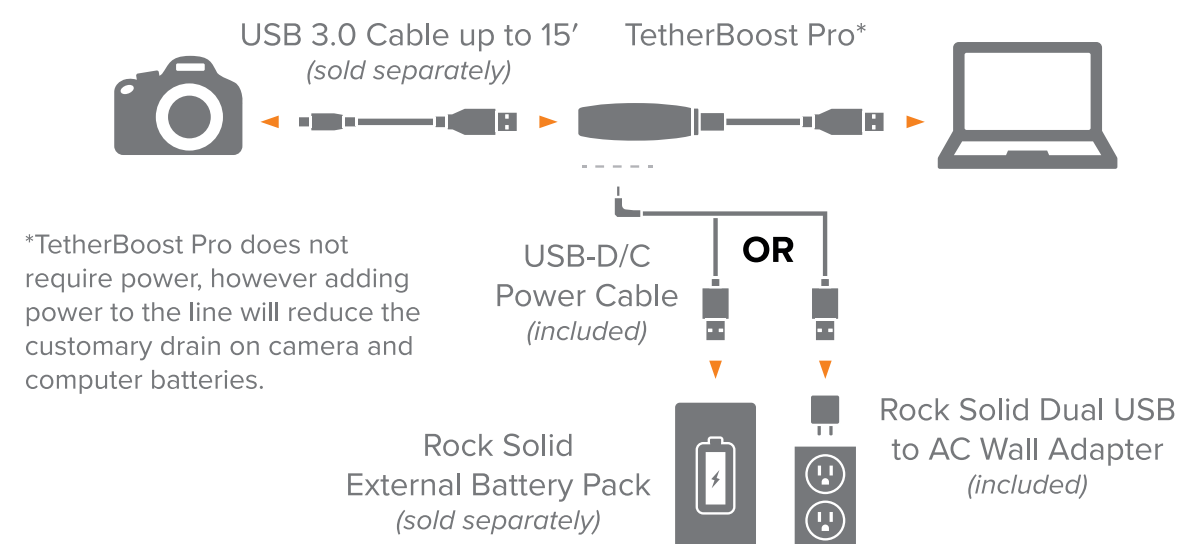
Due to the size of files produced by medium format digital backs and cameras, the maximum recommended cable length for FireWire 800 is 15ft (4.6m). Extending cables beyond 15 ft (4.6m) creates a very real risk of data loss. Adding a FireWire 800 Hub or Repeater to the connection can

reduce drops when adding a second FireWire cable to achieve the maximum length of 32 ft.

### USING USB 3.0 CABLES

The recommended maximum length for a single USB 3.0 cable is also 15 ft (4.6m). However, in order to save battery power, computer manufacturers are currently underpowering or dynamically powering the USB 3.0 ports causing inconsistent signals and incompatibility during USB 3.0 tethering sessions. With the common challenge of underpowered USB ports on laptops and computers, you may see connectivity issues even at 15 ft. If you experience dropped signals at 15 ft, adding a powered signal booster such as the [TetherBoost Pro USB 3.0 Core Controller](#) will help ensure a stable connection to the computer.

If you need more distance between your camera and computer, adding a TetherBoost will enable two 15 ft (4.6m) cables (or one 15 ft base cable plus four 16 ft (5m) Active Extension cables) to be used together to achieve a longer stable connection. For additional details on maximum cable lengths, cable compatibility and secure cable connections, see Chapter 5 of this guide.



*USB 3.0 tethered connections require a powered booster for long distance performance to ensure signal consistency and reliable image transfer. Optimal set up and power options are show above in this TetherBoost Pro Core Controller Diagram.*



## BACKING UP

When shooting tethered to a computer, you should do everything possible to make sure that you have an instant backup of your session as it progresses - just in case your hard drive decides to die on you right in the middle of it all. “That never happens to me” you might think... Well, it just might, and it’s always better to be safe than sorry.

Regardless of what camera or software you may be using or if you are shooting on location or in studio, the principle is the same - Shoot directly to your local hard drive and concurrently copy the content to an external drive. Whether that drive is a second drive connected to the computer or a network drive on your local network does not make much difference in the way the backup process is set up. However shooting directly to a local network drive is not recommended. If the network performance is not 100% consistent, it could lead to potential image corruption or loss.

Although some capture software solutions may provide an additional backup option, for the purposes of this article, we will be focusing on the process of backing up to a hard drive using an independent and dedicated stand-alone solution. Using a dedicated software application for our backup ensures that there is no interference with the capture software of any kind and that we are actually using an application which is designed to do exactly this - back up our data.

Choose a fast hard drive or SSD drive with a USB 3.0 interface if available. With continuous backup it is essential that the data is delivered as fast as possible so it won’t slow down the rest of the system.

There are many backup software solutions to choose from.” Or if you want it chattier “When it comes to backup software solutions, you have a large selection to choose from. Some solutions offer “on the fly” backup of your files – which means your files will be backed up immediately as you shoot. Others offer a regularly scheduled or occasional backup - which are activated as you have a break in the shooting. What you choose is not so important as long as it gets the job done.

Applications such as [Goodsync](#), which have the ability to sync in real-time are ideal for this job. There are plenty of options for both Mac and Windows to choose from but Goodsync is actually available for both platforms. It is very easy to set up and once activated you can concentrate on your photography with ease of mind.



### NOTE:

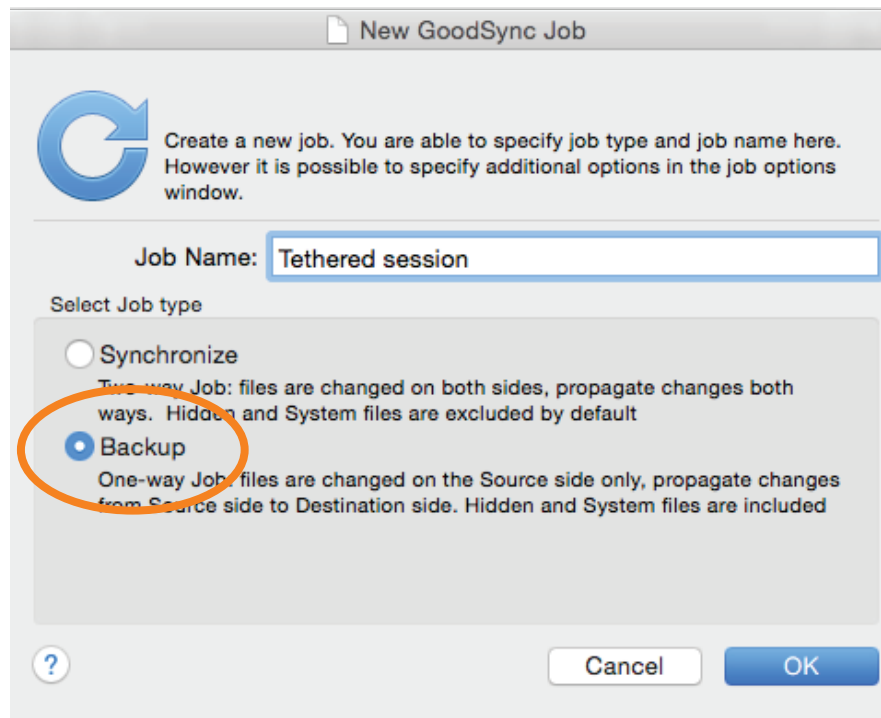
Both Mac and Windows machines have built-in backup features but controls are limited for what we are trying to do here. Time Machine (Mac) and Windows Recovery are incremental backup solutions, and not suited for backing up tethered capture sessions.

If you are working with the [recommended naming structure](#) for your capture folder (date, client, job, etc.) you will need to set that up in the backup software prior to each shoot, so that it knows where to copy the data from. This is an easy task and only takes a few seconds. Another option is to always use the same capture folder and then copy over the captures to the workstation or proper location after the shoot finishes. This approach gives you a “one-click” solution for every session. We will use this model for the step-by-step process outlined here.

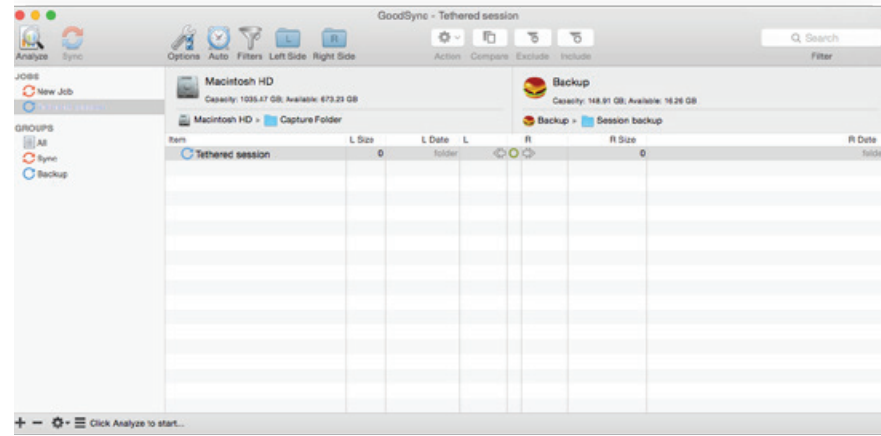
## A STEP-BY-STEP GUIDE TO SETTING UP AN AUTOMATED BACK UP SYSTEM

Before setting up the backup software, make sure that your hard drive is connected to your computer with the proper cable. We are showing how to do this using GoodSync but there are other backup options available as well.

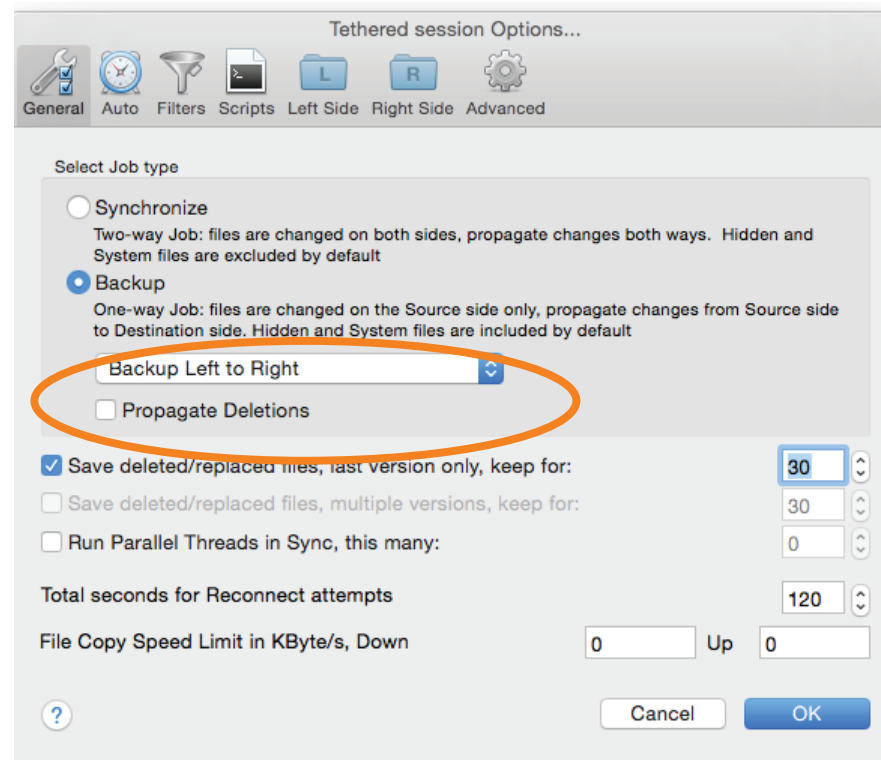
1. Launch Goodsync and create a new job and name it “Tethered Session”. Make sure to select the Backup option as we are only interested in a one-way synchronization.



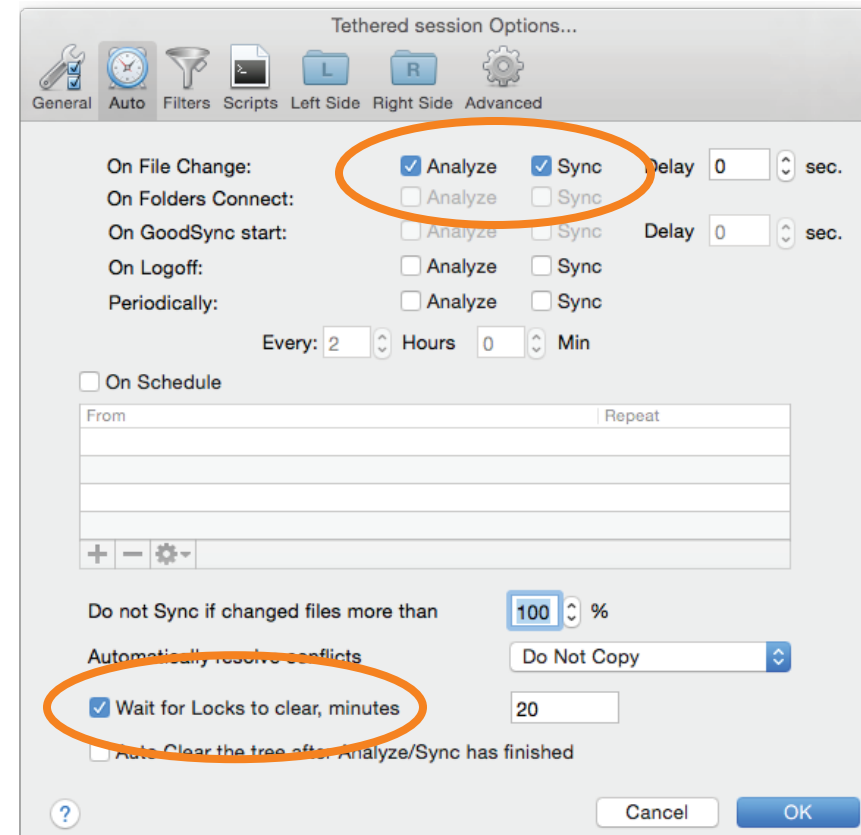
2. In the main window choose the source folder (Capture Folder) and destination folder on your external drive (we have named the folder “Session backup”)



3. In the General pane make sure “Propagate Deletions” is unchecked. This will ensure that if you accidentally delete files from the backup drive they won’t also be deleted in your capture folder.



4. In the Auto pane check “Analyze” and “Sync” to enable real time synchronization of your files. Leave all other options, except “Wait for Locks to clear” unchecked as shown below.
5. Click OK.



6. Launch your preferred tethering software and make sure your capture folder is identical to the source folder you selected in the backup software.

Now, when you start capturing your images to the computer, all files will be simultaneously copied over to your backup drive as they come in. Please note that this may have an impact on performance depending on the drive’s speed, the size of the files and how quickly you’re shooting. This is why some prefer to do incremental backup between series of captures.

## USING MANUAL BACKUPS INSTEAD OF AUTOMATED

If you prefer to do a manual incremental backup instead, simply leave out step 4 from above, then whenever you have a break in the shoot check the “Analyze” box followed by the “Sync” box as shown in the illustration for Step 5 and then click “OK”. This will initiate a backup of your files between your capture folder and your backup folder. You can repeat this action as often as you like.

The Analyze function in the software makes sure only new files are added to the backup folder.

Although we are specifically describing Goodsync in this article, the workflow outlined here would generally apply to all other backup solutions supporting real time sync as well.

## SETTING UP YOUR BACK UP DRIVE

Using the Tether Tools Aero Table with an Aero XDC (eXternal Drive Compartment) is ideal for this type of backup workflow as the external drive resides in its own compartment under the table and out of the way. Securing the [cable connection from computer to hard drive](#) can also help prevent unwanted disconnects during the capture session.

Storing and archiving your files are a critical part of a complete tethering workflow and there are many great resources for ensuring your files and business assets are optimally managed and secure. Below are additional links you may find helpful:

- [Backing Up, dpBestFlow.org](#)
- [Hard Drive Enclosures, dpBestFlow.org](#)
- [Setting up GTech Drives, by GTech](#)
- [Caring for Drives, dpBestFlow.org](#)
- Setting Up an Adhoc Network, Gary Mar-

