

Viltrox Focal Reducers ("Speed boosters") for M4/3 & Canon EOS M series

If you have any Canon EF lenses and either a Micro Four Thirds or a Canon EOS M series camera, then it makes good sense to have a look at the Viltrox Focal Reducers EF M2 and EOS M2 respectively.

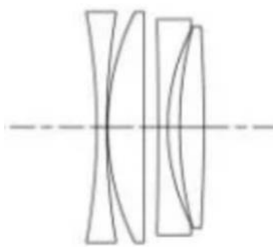


The Viltrox EF-M2 and Canon EF 24-105mm F4 lens on my Panasonic Lumix G9

For those hearing about the term for the first time, called a focal reducer is a converter that increases the aperture by up to 1 f-stop and reduces the focal length of an attached lens by 0.71x. Therefore, it does the opposite of a tele converter, which increases focal length but decreases the f-stop.

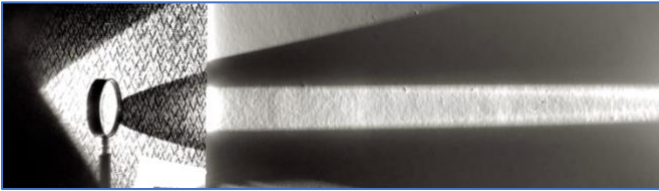


The EF- M2 and EF-EOS M2 differ from the EF-EOS M Canon converter as it has a lens element in the unit.

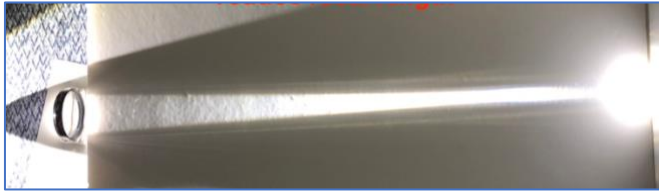


Most likely the lens system is like the one on the left which acts as a convex lens system. By the optical nature of a convex lens it converges the rays of light from the camera lens to a point in front of the main lens focal plane.

Therefore, when used with a shorter flange back allows the image to be focussed onto a smaller sensor with increased light due to the smaller image circle formed.



Here in my illustration I have a lens system with a long focal length. You can see that the rays are converging to form an image.



Here I added an extra convex lens into the light path and you can see how this reduced the point where the image is formed. It has effectively reduced the focal length of the initial lens.

By careful design of the addition lens group it is possible to make this lens form an image which is just large enough to cover either the M4/3 sensor of the APS-C sensor in the EOS M.

Because the image is formed closer to the main lens the thickness of the adaptor mount is reduced from 26mm to around 21mm in the case of the EOS M.

The new lens still allows infinity focus and with the EOS M APS-C sensor reduces the usual x1.6 crop factor to x1.14. On the M4/3 system the x2 crop factor is reduced to x1.42.

Because the imaging circle that is formed is smaller the intensity of this image is brighter. It gives the effect of 1 f-stop gain in light. As an example, the 24-105mm F4 lens used on the EOS M with just the canon EF-EOS M adaptor becomes a 38-168mm F4 lens but using the Viltrox becomes 27-120mm f2.8.

So, the net effect is more like you see when using the lens on the full frame camera but with a speed gain of 1 f-stop.

These devices have been used by amateur telescope makers for a long time to increase the brightness of the image on the sensor of their astrophotography telescopes. It allows them to image distant galaxies with very low light using shorter exposure times.

To validate the claimed 0.71 x reduction I used my 100mm F2.8 macro lens with the Viltrox EOS M2 to establish the width of the image at full sensor pixel width (4:3) giving the 6000x4000 pixels.



You can see that the width of the image is 93mm and the distance to the sensor was 470mm. Using a bit of trigonometry to work out the tangent of the midpoint 46.5mm as the opposite of the right-angle triangle and 470mm as the adjacent returns an angle of 5.65 degrees so the real field of view is 2x this or 11.30 degrees.

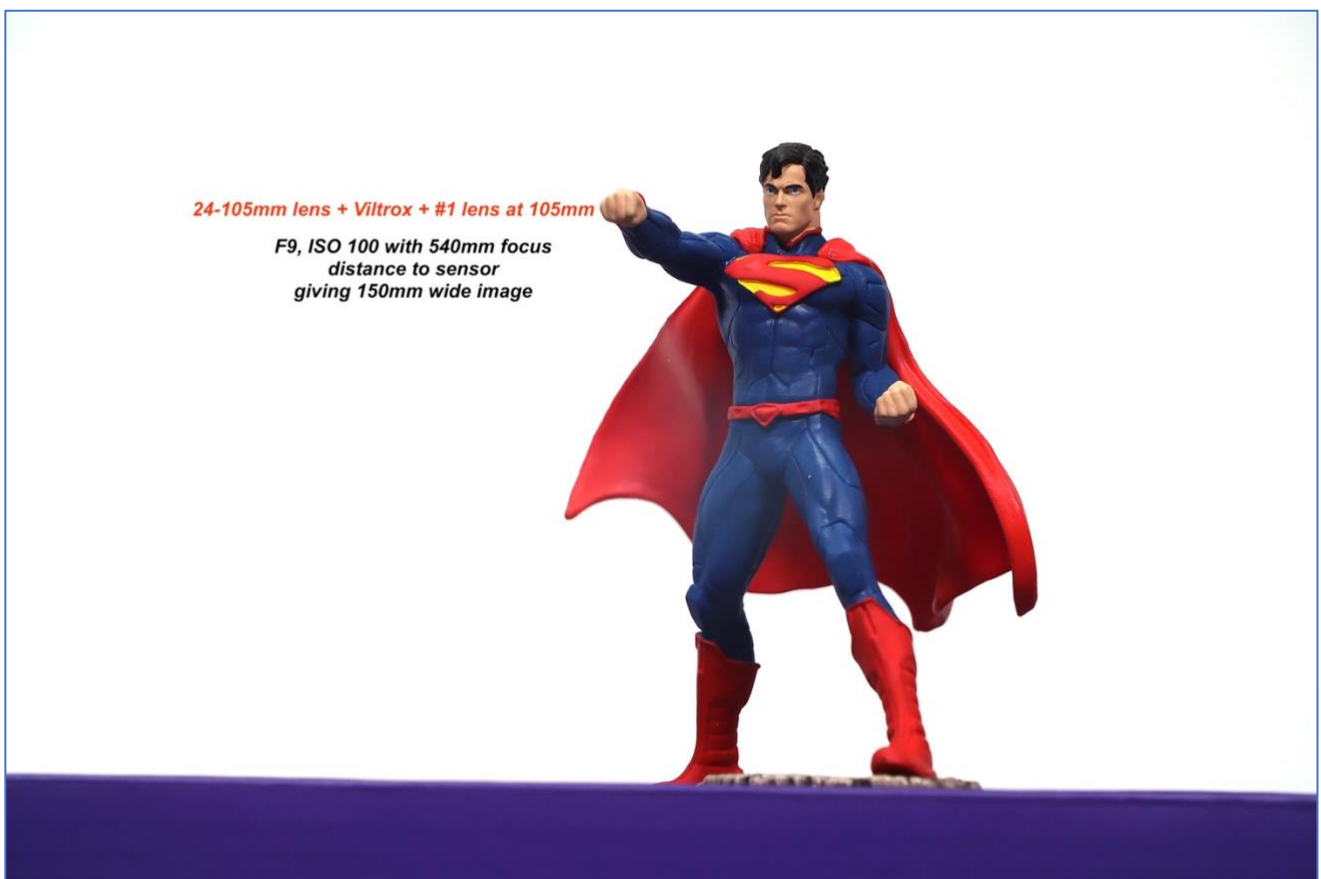
From FOV tables this equates to a focal length 112.4 mm. Using the given 0.71X magnification the theoretical focal length of $100 \times 1.6 \times 0.71 = 113.6\text{mm}$.

So, close enough to call accurate!

Now when you understand how the optics work, with a little “experimentation” it is easy to modify how these units work to produce some pretty useful lens magnifications for close-up work. This is what I have been doing over the last couple of days. I have experimented using 37mm #1, #2 and #4 dioptre lenses in front of the first element of the focal reducer and between the last element of the 24-105mm EF lens. With care, it is possible to align the lens and then fix the lens to the focal reducer and it stays in place without touching either element.



With the addition of a suitable small cylindrical tube between the lens and the inner wall of the adaptor it would be possible to get the lens centration correct and hold it in the correct position on the optical axis. This would help prevent hot spots due to reflections of the image from the sensor and the new lens (which isn't coated). Some pretty encouraging results are emerging.



I made a thin black card ring and slotted this down between the Viltrox EOS M2 lens and the adaptor body. This helped to keep the #4 lens centred whilst the main lens was attached.



I also tried a ND8 Filter in front of the first element of the Viltrox system. Using a 37mm filter is a substantially cheaper option than using 72mm on most of my EF lenses. My only concern was internal reflections but so far I haven't noticed any.



An image using the adaptor with the centring ring fitted.



an image taken with the ND8 Filter in place - NO VIGNETTE.

A DIY Flash reflector for the Godox AD200



I wanted to create a larger flash reflector to give softer lighting for my table-top photography. I had a couple of the small reflector dishes and when I saw these light shades in the reduced bin at a local store it struck me that they would make great reflectors if I somehow could get the smaller reflectors inside the larger housing. With a little cutting with a fine-tooth blade hacksaw and a little silicone adhesive the project was complete. Here is the stages I took to make it.



So here is the lampshade ready to be marked out for cutting.



Marked in the middle of the grooved area ready for cutting.



After cutting there were some very sharp edges which needed to be covered. I used the outer covering of a length of wire cable. I cut it to length, slit it down the middle and then placed it over the raw cut edge.



The small reflector dish was then fixed into the new reflector by using a silicone adhesive.



Image taken with the new reflector on the AD200 using the Viltrox EOS M2 and 24-105mm lens with the #4 dioptre modification. F8 @ ISO 100.

Image Subject Motion Blur

Motion blur is the streak-like effect that occurs when shooting a still image or video, because your subjects are moving rapidly through the frame, or the camera exposure is particularly long.

The camera image stabilisation does a great job compensating for any camera movement such as hand-shake but this does not arrest any movement in your subject.

The amount of blur in a subject which is in motion will depend upon several situations.

The rate at which the subject position is changing. i.e. the speed of the subject

The direction of the movement - towards or away from the camera in a straight line, at some angle to the camera.

The focal length of the lens being used to capture the action.

The time that the shutter is open (the shutter speed).

The blur can be used intentionally to create a smooth, silky like appearance with running water the waves on a beach etc. We do this by selecting a long shutter speed – often $\frac{1}{2}$ second or longer.

However, when we want tack-sharp images we need to employ a faster shutter speed – but how fast?

There is a “rule-of-thumb” that states that using the reciprocal of the lens focal length should be enough to prevent any motion blur. This rule applies to the full frame lens equivalent so if you are using a micro four thirds system don’t forget to factor in the 2x crop factor or 1.6x on an APS-C sensor size camera.

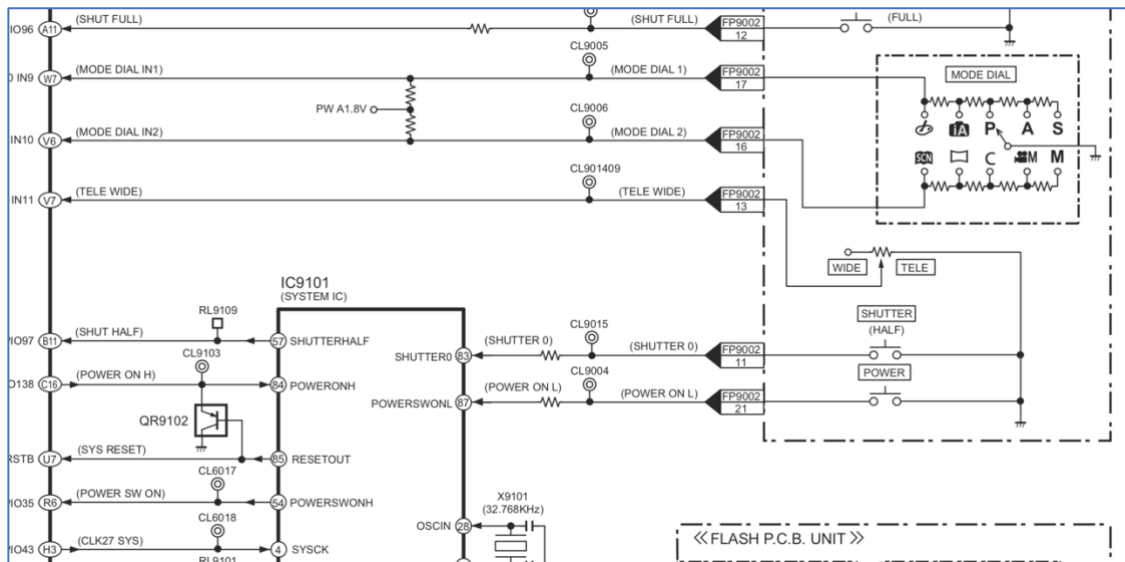
Most of the zoom cameras display the equivalent lens focal length either on the lens barrel (like the FZ1000) or on the LCD as you operate the zoom lever.

So if the equivalent focal length of the lens is 250mm then the rule says use 1/250 sec. This I would suggest is the minimum shutter speed and for sports or action photography I would use an additional factor of 4 to get absolute sharpness and no motion blur so 1/1000 sec might be good in these situations.

FZ300/330 Zoom Lever Failure Feedback.

From my request in the previous newsletter to let me know if you were experiencing problems with the zoom lever around the shutter button.

Twenty-seven of you reported that you had the failure, or intermittent failure, of this control.



The schematic for zoom control

When I looked at the schematic for this control it shows this control as a variable resistor (potentiometer) and the input is used as an analogue voltage on one of the analogue to digital converter (ADC) inputs. The voltage being representative of the position of the “wiper” on the variable resistor. What struck me was that all the other inputs (like the other zoom lever on the lens and the top mode dial) had pull up resistors to a stable reference voltage – usually 1.8v

The schematic shows no such pull up on this input so if that is the case there is a possibility that the voltage being “read” by the ADC is “floating” as ADC inputs are normally not internally referenced to either ground or the VCC supply. Now it could be that the schematic is just wrong and that there is a tied reference voltage. If this input is floating it may explain why sometimes the control will work, sometimes the control will zoom one way but not the other or, as mine does, zoom in but then zooms back out depending on the position of the control on the tele side.

Now I was going to disassemble my camera to have a look at the problem however looking at the breakdown diagrams it shows two heat pads which need to be removed when taking out the CPU/mainboard to gain access to the upper unit. Now these could be standard copper based paste pads or they may be some special pad created for this unit. Either way to remove the mainboard would destroy the pads and they would have needed to be replaced. Additionally, the potentiometer is not available as a spare – you must purchase the whole top control unit which has the mode dial, flash housing and microphones etc. If it was in stock here in the UK it would be £120.

As I’m using the FZ300/330 far less than I used to, I’ve decided to live with the problem. The side zoom lever doesn’t have the same control as the top lever but is still an option.

For a control, which is going to be used most frequently on the camera, it has been a poor choice (just like the rear control wheel of the FZ200) of component.

My FZ2000/2500 also has developed an SD card problem – it no longer ejects the card when you push on it – I must pull the card out (which isn't easy).

For a few years now I've been less than impressed with the TZ(ZS) and LX series cameras and their lens/sensor dust seal and I no longer purchase or recommend these cameras. They are not cheap and Panasonic changed their service policy to exclude sensor cleaning under warranty.

My friend, who works in a large camera store, reports that Panasonic cameras are now becoming the number one camera for return under warranty for either dust in the lens, or failure!

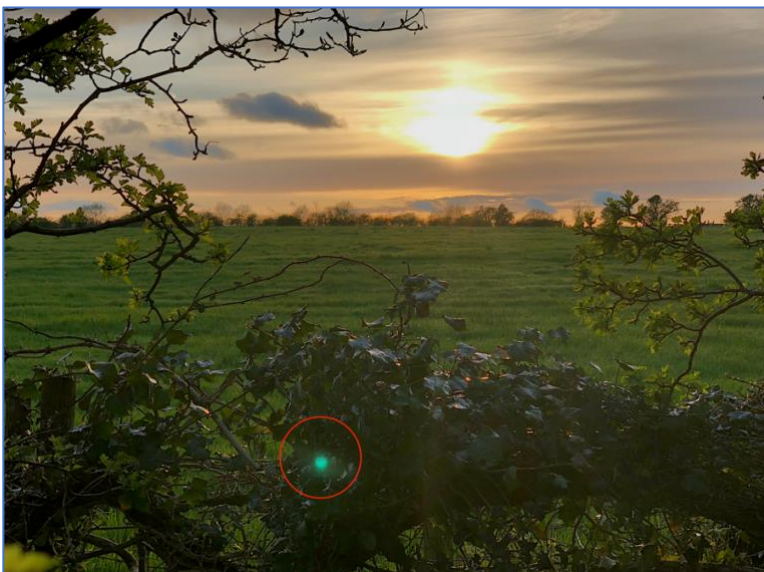
Is R&D suffering with the downturn in camera sales in these areas?

You have probably heard me complain of the number of random shots and video clips that I have because of the hair trigger nature of the Panasonic G9 shutter release – something that I only discovered when I purchased the camera – it was never cited in any of the reviews that I read prior to that. If Panasonic do bring out an FZ400 or FZ3000/3500 I will certainly be giving it a very thorough testing in a local dealer before I make any decision to buy it.

Lens Flare & Ghosting, Why it Happens and Ways to Reduce It.

Lens flare is created when non-image forming light enters the lens and then subsequently hits the camera's sensor. This often appears as a characteristic polygonal shape, with sides which depend on the shape of the lens diaphragm. It can lower the overall contrast of an image significantly and is often an undesired artefact.

However, some photographers use types of flare may enhance the artistic meaning of their images. Cinematographers also induce flares in some scenes to accentuate a look etc. Understanding lens flare can help you use it — or avoid it — in a way which best suits how you wish to portray the final image.



reflection from lens surfaces with light source in the image



"veiling" - light outside the image but striking the lens

All but the simplest cameras contain lenses which are comprised of several "lens elements." Lens flare is caused by non-image light which does not pass (refract) directly along its intended path, but instead reflects internally on lens elements any number of times (back and forth) before finally reaching the sensor.

Lens elements often contain some type of anti-reflective coating which aims to minimize flare, however no multi-element lens eliminates it entirely. Light sources will still reflect a small fraction of their light, and this reflected light becomes visible as flare in regions where it becomes comparable in intensity to the refracted light (created by the actual image).

Wide angle lenses are usually better designed to combat flare as the light source may be present in most images taken with these lenses.

A good lens hood can all but eliminate flare caused by stray light coming from outside the angle of view. The best lens hoods have a completely non-reflective inner surface, such as felt or flocking. Although using a lens hood may appear to be a simple solution, most lens hoods do not extend far enough to block all stray light. This is particularly problematic when using full frame lenses on digital cameras with a "crop factor," because these lens hoods were made for the greater angle of view. In addition, hoods for zoom lenses can only be designed to block all stray light at the widest focal length.

Petal lens hoods often protect better than non-petal (round) types. This is because petal-style hoods consider the aspect ratio of the camera's sensor, and so the angle of view is greater in one direction than the other.

If the lens hood is inadequate, then a hand or piece of paper (called a flag) to the side of the lens which is nearest the flare-inducing light source can mimic the effect of a proper lens hood.

Another solution to using full frame lenses and hoods on a camera with a crop factor is to purchase an alternative lens hood. Look for one which was designed for a lens with a narrower angle of view (assuming this still fits the hood mount on the lens).

In general, fixed focal length (or prime) lenses are less susceptible to lens flare than zoom lenses. More complicated zoom lenses often contain more lens elements. Zoom lenses therefore have more internal surfaces from which light can reflect.

Reducing flare can be a difficult task, especially in some aspects of composition where the light source may be fully, or partially, in the image. Under such circumstances it is essential to remove any protective (UV) filters that you may have in front of the lens and be especially vigilant when using variable ND filters as you have 4 air to glass transitions which do increase the likelihood of flare.

Camera Memory Card Back-up Whilst Travelling

I was asked, once again, for cost effective recommendations to permit the back-up of images taken using, in this case it was the FZ200 but it can be any camera, whilst travelling to exotic destinations and not wanting to lose the images.

Now whilst there are portable hard-disks with self-contained power banks with the facility to copy the contents of any SD card that is inserted into its SD card reader they tend to be a little pricey and from the reviews that I have read tend to be quite unreliable and suffer from the problem that if you transfer images and videos across to the device if you then reformat the memory card and use it again if you have files with the same name (such as with video files) they would not be copied across as the device thinks that it has already backed up these files!

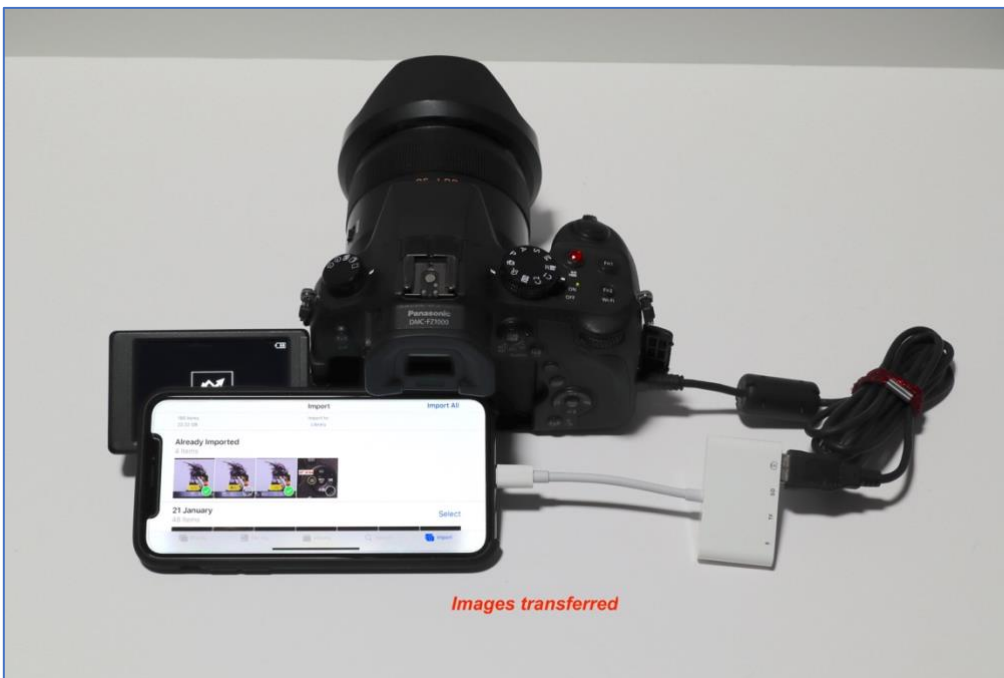


For the iPhone Apple produce a "camera connection kit" however far cheaper and with more options there are several these USB OTG devices which have inbuilt SD and microSD card readers and allow charging of the phone simultaneously.

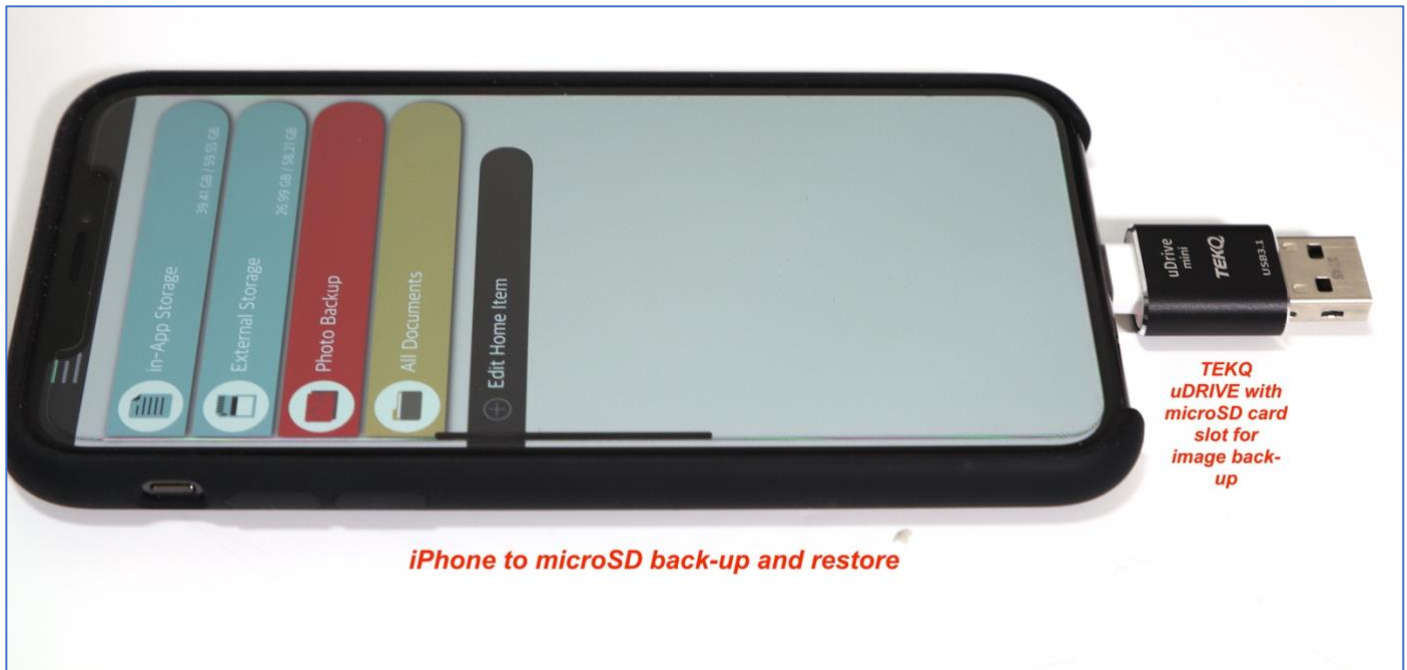


So, with one of these devices you can either connect the camera via its USB cable to the OTG device or remove the SD memory card and insert it into the device. The camera when connected via USB should prompt for the method of connection – you should select “PC”. The PTP protocol is used for connecting to printing devices.

Once the connection is established the “Photos” app on the smartphone will open and allow you to select all or individual images/video to transfer to the smartphone.



Once the images have been transferred to your smartphone you have a second copy but as extra measure if you want to add another level of redundancy you can use a device shown in the next illustration which allows you to transfer the camera roll to a flash drive.

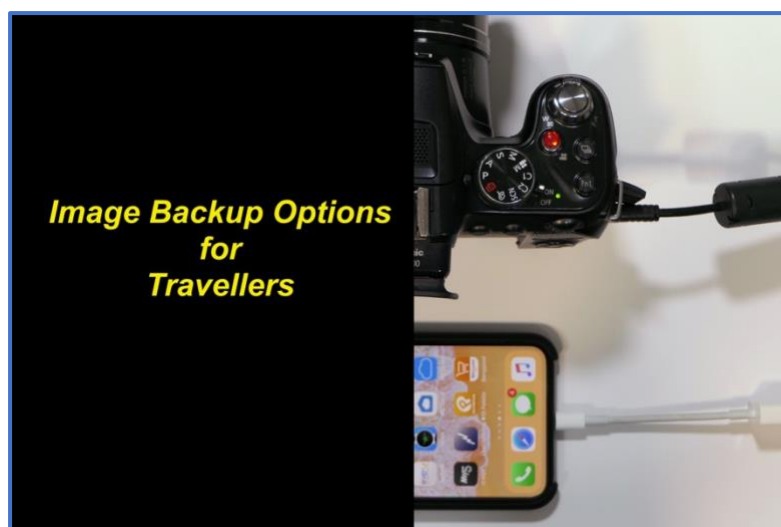


The device shown here is the uDrive by TEKQ which has a microSD card slot inside the USB 3.0 connector! So you can insert a 128GB microSD card into this unit and with the supplied app back up the entire contents of the camera roll (only this directory as Apple limit the access to other directories) to this drive. When you get home you can plug this into your PC/laptop and copy the files over for editing. As an extra bonus the uDrive can be used as extra memory for the iPhone – you can record directly to this card by selecting the option in the setup menu. The camera and video recorder are fully auto with no user choices available!

There is another solution which also requires a file hub, smartphone and USB flash drive or portable hard disk which I have reviewed previously.

I have done a YouTube video showing these options:

<https://www.youtube.com/watch?v=bqaRZKzpIM0>



The 3rd party 4 in 1 Lightning to USB Camera Connection Kit SD TF Card Reader link on Amazon UK <https://amzn.to/2Br3DbL>

The FZ300/330 Capturing Stunning Kingfisher Images.

I've featured the work of April Daly here in these newsletters before and she kindly did a disclosure on how she captured her great images in the [meet-the-photographer blog page](#)

I noticed this image on her Facebook page and just had to ask her permission to show it to you.

Not only to showcase April's talent as a photographer but also the incredible versatility of the FZ300/330 for both macro (with a Raynox lens) and for wildlife shots where the small sensor with 5.4x crop factor gives super telephoto shots.

Combine this with F2.8 light gathering ability and good light the images compare extremely well again larger format compact system cameras and DSLR's.



You can find more of April's work on her Facebook page <https://www.facebook.com/april.daly.33>

April is a long-time member of the FZ200/FZ300/330 User's group on Facebook and if you have either (or both) of these cameras why not join the group as there are a lot of very talented photographers now posting their work there and if you have any questions or want critique of your images then there is usually someone on there that can give you help and advice.

The user's group can be seen here: <https://www.facebook.com/groups/fz200/>

Portable DIY 500GB SSD (Solid State Drive)

With the cost of memory modules becoming relatively inexpensive compared to traditional hard disks it made sense to me to look at making a 500GB solid state drive that would be robust and lightweight and easily used as either faster external storage for my PC or for local backup of camera images whilst travelling in conjunction with the Ravpower FileHub plus device.



So, this module - the 500GB M.2 2280 NAND FLASH Memory, the USB to SATA interface board and the aluminium enclosure were purchased from Amazon.

The cost was £9.99 for the enclosure, £8.99 for the interface pcb and £62 for the memory module so £82 for the 500GB storage.

Simple to put together and just needed formatting using the device manager of my PC to make it a fully functioning external drive with no moving parts.

From Western Digital: The WD Blue 3D NAND SATA SSD utilises Western Digital 3D NAND technology for capacities up to 2TB with enhanced reliability. Featuring an active power draw up to 25% lower than previous generations of WD Blue SSDs, you're able to work longer before recharging your laptop, while sequential read speeds up to 560MB/s and sequential write speeds up to 530MB/s give the speed you want for your most demanding computing applications.

I put the whole thing together in literally five minutes with the supplied hardware and tools. I used it to transfer all the 4K source files for the latest YouTube video and did all the edits using it as the external drive. Certainly, fast enough for trouble free editing.



I've just purchased this 2.5 inch SATA drive enclosure plus a 480GB SSD SATA drive. It is capable of single push SD-HD/SSDF back up, use as an external drive, Wi-Fi connectivity and LAN connect.

It can also act as a power bank which could also come in handy at times.

It is supported by a smartphone app but my understanding is that once set up you can initiate a SD card back up by a press of the button.

I'll be doing the install video plus a review next week of the software and how easy it is to setup and use.

Canon and Nikon Post Falling Sales Figures

Recently both companies showed revised forecasts for their digital imaging product line with the underlying decrease in both DSLR and mirrorless cameras.

Sure, the smartphones are getting even “smarter” by each release and even capturing RAW files (not that the average user would use them) however it does signal, to me, that these are becoming an absolute essential part of my camera kit.



The image above is from my iPhone X and even displayed on my 27 inch iMac is full of detail.



This is a 100% view and screen grab from part of the image – something that is amazing given the sensor size – but it is down to the pixel count. Of course, low light is an issue but in average lighting the out of camera results are excellent and more than adequate for most people wanting “snapshots” of vacations etc.

With “advanced photo apps” like Lightroom mobile or Camera plus where RAW files can be captured then even better results can be obtained if you want to spend the time processing them.

With the latest image file formats, which deliver smaller file sizes with no discernible loss of quality, traditional camera makers are letting advances in technology slip away – Reminds me of Kodak!



Again, an iPhone X image with its small sensor/lens combination producing effective depth of field from cms to infinity plus a good, in my opinion, range of highlight – shadow detail. With a DSLR you would be looking at F16/22 to get the same results. With the fact that the camera is in your pocket and no need for a backpack of lenses to restrict your enjoyment of walking and hill climbing no wonder that these are becoming the “people’s choice”. With the dual lens giving wide angle or short telephoto capture the later cameras are certainly very, very attractive purchases.

Is Traditional Photo Editing Also on the Decline?

If my son and daughter are typical of the “younger” generation, they take hundreds of pictures with their smartphones. Some are precious moments like our grandchildren growing up.

However even though they have witnessed “dad” shooting their photos for their whole lifetime and my insistence for getting as perfect a shot that I can achieve and then editing the final image they don’t seem to have embraced the “art of photography”.

I’m sure that this is typical of most smartphone or point and shoot compact camera users.

More so I guess with the smartphone users where it’s important to them to get the immediacy of the image up on their social media sites like Instagram or Facebook.

So how many spend the time editing their images in camera? By editing I don’t mean adding some crazy filter/distortion/emoji etc., I mean adjusting properties such as highlights and shadows.

I guess not many.

If I get sent a picture of the grandchildren its normally taken against the light coming from patio windows and generally underexposed.

It takes literally seconds to open the editor on the phone and make a decent image.

Does this mean that people are getting lazy on this fast-paced society or is it that we are becoming less critical of the images that we produce?

If we are becoming less critical of the images and no longer want to spend the time looking for the right composition, waiting for the light to fall perfectly on our landscape pictures, or learn how to light our indoor photography projects then surely the need for complex digital cameras is no longer valid and hence the tumbling sales of DSLR’s. If you look at the demographics, then the DSLR/CSC camera buyers are like you and I – the older end of the age spectrum and not the 18-30’s group of snap-shooters!



Photographed against a pure white background and in silhouette and then composited over a moon image toned in light blue

Until the next edition, thanks for reading and I do appreciate your subscription and comments –
Graham