

The FZ1000 Users Guide

After two years, I have finally finished this guide and managed to get it through the Amazon publishing system so that it will be available for sale in most countries by the time you receive this newsletter.



However once again I am disappointed in the pricing structure for producing the book in the colour format. Had the paper been premium or semi-gloss then the quality of the printed photographic illustrations would have been Okay.

As the process stands the illustrations would be Okay for graphics but not photographic illustrations with rich tonality.


The Black and White version is half the cost and I feel that it does the job of conveying the information needed. In addition, every purchaser will receive the full colour PDF document which does maintain the integrity of the colour photographic illustrations. The PDF also allows much better searching of the document as I was not able to generate an index for the book as when I tried the whole document pagination went haywire and pictures jumped from page to page so I decided that the table of contents would be sufficient.

I cannot honestly justify the Amazon price for the book and if I was to add even a slight profit on it then I feel it would be cost prohibitive for many people wanting this guide. So, my recommendation is for the Black and White version with the FREE Colour PDF download If you send me the details of your Amazon order.

For those subscribers wanting to purchase this guide, or the FZ300/330 guide book the process has changed slightly as the “store” software that I was using does not allow two passwords protected store fronts. So, to overcome this when you now make a purchase you will get a confirmation email after you go through the PayPal checkout page (if you have no Paypal account then you use the Guest Checkout to facilitate the transaction). If a Guest checkout tick both boxes as shown below.

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POST Script, thank you to the 19 subscribers who have already downloaded the guide

Panasonic Lumix DMC-FZ1000 II

As I mentioned in the previous newsletter this update to the existing FZ1000 is due for sale at the end of March and I have a pre-order in for the camera with priority shipping paid.

At this point Amazon UK don't seem to have the camera listed (which is strange as they normally have pre-order facilities for all other cameras) however it is on the USA site [affiliate link](#)

I am eager to get this camera and test it out for the improved touchscreen, EVF and video capabilities. I will bring you a full report in the next newsletter.

Using EX, i.ZOOM and Digital Zoom on Panasonic Bridge Cameras

I recently re-visited this useful feature with the type 1 inch sensor cameras (like the FZ1000 and 2000/2500) to see if there was any improvement to the image quality that is achieved with the smaller 1/2.3 inch FZ80/82/200/300/330 cameras.



Image from the FZ80/82 using EX-M extended optical zoom giving 2446mm EFL

Whilst the EX modes don't give you the claimed Extra Optical Zoom the mode does allow you to preview and capture the JPEG images in-camera without any additional processing. It's much easier to get the framing that you want and check that you have critical focus when seeing the enlarged image.

I have a full write up on my [Photoblog Phototalk page](#) that explains how each of these modes work with some useful comparisons from both bridge cameras and the Compact Systems Cameras like the G80, GX85 and the G9 cameras.



Sample image using the EX-M 8M image size which extends the 400mm to 560mm

Desk Top Practice

Storm Gareth passing through, heavy winds and rain showers – perfect for a bit of table top practice.



Off camera Godox TT685o speedlite triggered by the Godox Pro trigger. Olympus OMD M1-mk2 with 40-150mm pro f2.8 lens Speedlite at 45 degrees to the model and 45 degrees above it with small diffuser in place 1/250s F2.8 @ ISO 100 1/64 power.

The 45/45 lighting to replicate the sun's position and cast the small nose shadow. The flash was about 2 metres away with a small plastic diffuser so still acting as a point light source. Using a white foam board reflector held to the right to bounce a little light back to soften the shadows. The white paper background was ½ metre behind the model and gained enough light without being blown out.

Why is Flash Duration So Important and Why it is Often Never Quoted?

When it comes to measuring flash output power we would normally use a flashmeter.



I currently use the Sekonic L-478D as it provides both incident daylight and flash power measurements as well as the exposure for HD camera video.

It is quite a sophisticated unit and can provide many elements of the exposure such as the light level in LUX or Foot Candles, The EV number, the ratio of flash to ambient light and can be used for either incident or reflected light measurements.

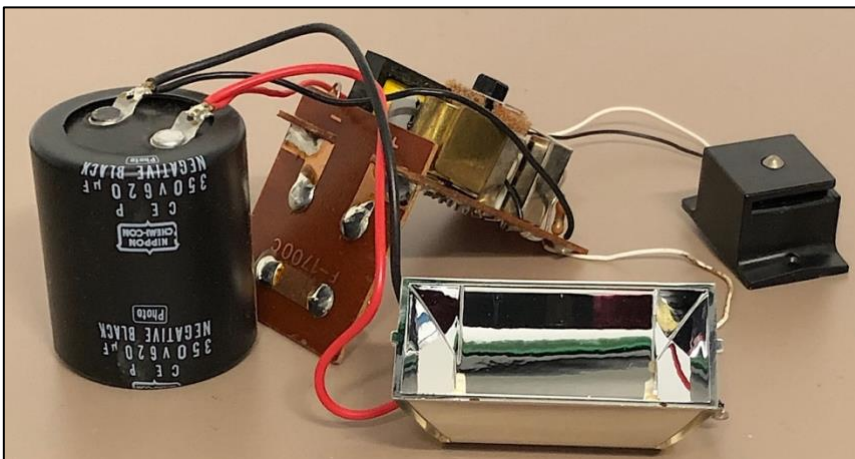
What is not captured by this model of flash meter is the “flash duration”.

Flash duration is important if you want to ensure that the flash pulse produced by your electronic Speedlight, studio strobe or camera pop up flash is going to be short enough to “freeze” the action that you are attempting to capture.

Now electronic flash units have evolved considerably over the older units and will normally include an IGBT (insulated gate bipolar transistor) in the output from the flash capacitor to the xenon flash tube.

This transistor can cut off the power going to the tube in microseconds by the flash controller. In this way, the power can be controlled going into the tube to create the light output.

Older units would “dump” the whole of the charge on the capacitor into the flash tube. Some units would also “squench” the output by dumping the charge into a dummy load thus effectively stopping the light output. Both methods were disadvantageous as the charge built up was always fully depleted and required the flash power circuits to charge it back up to the “ready” voltage before the flash could be used again. So even if you only needed a brief output you had to wait many seconds whilst the unit recharged. The modern units only discharge what is needed for the output power level. So, if the exposure required a brief pulse the unit could quickly recharge the partially depleted capacitor back to the full charge very quickly.



One of the older flash units which dumped the full charge on the 620uF capacitor, which was probably charged to around 300volts, into the flash tube to create the intense but brief flash light.

(note if you ever open a flash gun ensure that you discharge the flash capacitor for if the gun was turned off fully charged the high voltage can remain for several days – depending on the quality of the capacitor)

We naturally assume that flash output is indeed very short duration as we have probably seen examples of water drops splashing into water or darts bursting a balloon. In the real world, this can be far from the truth and some flash exposures can be as long as the highest sync of your DSLR or CSC – in the order of 1/200 second.

When the FULL output flash power is required (the one by which the manufacturer quotes the guide number) the flash tube needs to output light for a longer duration than when it is required to output say 1/128 of its power.

In modern flash units, the flash pulse intensity is always the same but the duration of the pulse shortens as we require lower power.

However due to the nature of the discharge of the current through the Xenon gas in the flash tube the intensity/time graph is not linear. In the very first ignition of the gas the light output is very fast to rise to its peak but then there is a longer tailing off in the intensity as the charge on the capacitor falls.



This is a typical light output from a modern flash unit at full power. You can see the very sharp rise and slow tail off in the illumination. You can see that the flash duration is 1/835sec or 1.20 milliseconds.

At full power the flash pulse can last as long as 1/200 second on higher powered studio flash units.

If you were wanting to capture any sort of action photography, then this would result in subject motion blurring as we would normally be using exposures in the region of 1/1000 second for this type of photography.

So how do we achieve a shorter flash exposure time? Well we need to shorten the tail off in illumination and we do this with the IGBT that is in series with the flash tube. We can cut off the current flowing through the tube at any instant after it has been switched on. By doing this we can achieve incredibly short pulses of 1/16000 sec or faster. Of course, we have achieved this by effectively reducing the power output to fraction values of the flash units quoted output guide number.

So, how do we know just how long or short the flash duration will be at any given power output level?

Well some manufactures quote the pulse time and on my Godox studio flash units this value is shown on the flash LCD panel.



Here is the display of my Godox AD200 flash unit showing that at 1/128th power the actual flash pulse duration is 1/10526 secs.

You might also notice that this is the t0.1 time. This is the most important parameter to consider when looking at choosing a flash unit for high speed photography.

The t0.1 time is the time of the flash output pulse when the output illumination is above 10% of its peak output. That is to say it is most of the “usable” light output.

Using the new Sekonic L-858D flash meter, which can record and graph the flash duration, I have recorded the t0.1 and t0.5 flash times for all my main flash units.

Here is the Godox TT350o which is my current recommendation for Panasonic cameras.

Flash power level	t0.1 duration	T0.5 duration
full power 1/1	1/704	1/1960
1/2	1/2210	1/2480
1/4	1/4120	1/5290
1/8	1/6730	1/10100
1/16	1/10300	1/17800
1/32	1/13900	1/27800
1/64	1/20200	1/49400
1/128	1/23400	1/55600



As you can see from these results at full power the Godox TT350o does have a fast exposure pulse of 1/704 seconds.

This is typical of a flash unit with this guide number.

You can also see how the IGBT cut off the pulse to create this much shorter duration slash pulse.

If you compare that to the much larger TT685o you can see that the full power exposure pulse is much longer as the flash capacitor is much larger and takes longer to totally discharge into the flash tube.

Flash power level	t0.1 duration	T0.5 duration
full power 1/1	1/406	1/1230
1/2	1/1280	1/1350
1/4	1/2800	1/4170
1/8	1/4780	1/6090
1/16	1/7530	1/11100
1/32	1/12000	1/22200
1/64	1/16500	1/37000
1/128	1/20200	1/49400



So, what can we take from these results? Well if we were using the TT685 flash unit on a Panasonic CSC like the G series camera the flash synch speed is 1/250 sec so this is longer than the full power flash pulse – so there is no problem.

However, if we used this unit on a bridge camera which can synchronise flash at all the available shutter speeds if we set a shutter speed of 1/500 second (to reduce the ambient light portion of an outdoor flash shoot) then the shutter would cut of the flash duration as well as this is longer than the shutter speed.

This means that you will not have used all the light available from the flash during the exposure. If you were shooting water droplets splashing into water the setting the flash unit to 1/32 power would give a very brief 1/12000 sec flash pulse.

Work in Progress – Analogue Lightmeter

I, sometime ago now, built a digital light meter using an Arduino microcomputer and silicon diode sensor. I was repairing some of the garden solar lights ready for a new season when I thought about the possibility that one of the solar cells could be used as a basic light meter.

So, I bought a cheap 3v DC analogue meter and connected this straight across the solar cell.

Now the response from the solar cell is not linear (probably logarithmic) so the scale would need to be reprinted once I have established the total brightness range but for typical daylight readings somewhere mid-scale is possible



lights dimmed to give 1/30, f4 @ ISO using my light meter

The domed diffuser is one from a failed LED lamp bulb, this helps to even out the light collected and prevents it from being too directional in use. The linearity might be improved by loading the photocell however this would mean a more sensitive meter or some form of dc amplification with an op-amp. This would add complexity to the project. More thinking on this one.

By removing the scale from the meter and taking a photo of it then in photoshop it would be easy to make a new scale with f-stops on the scale instead of the voltage.

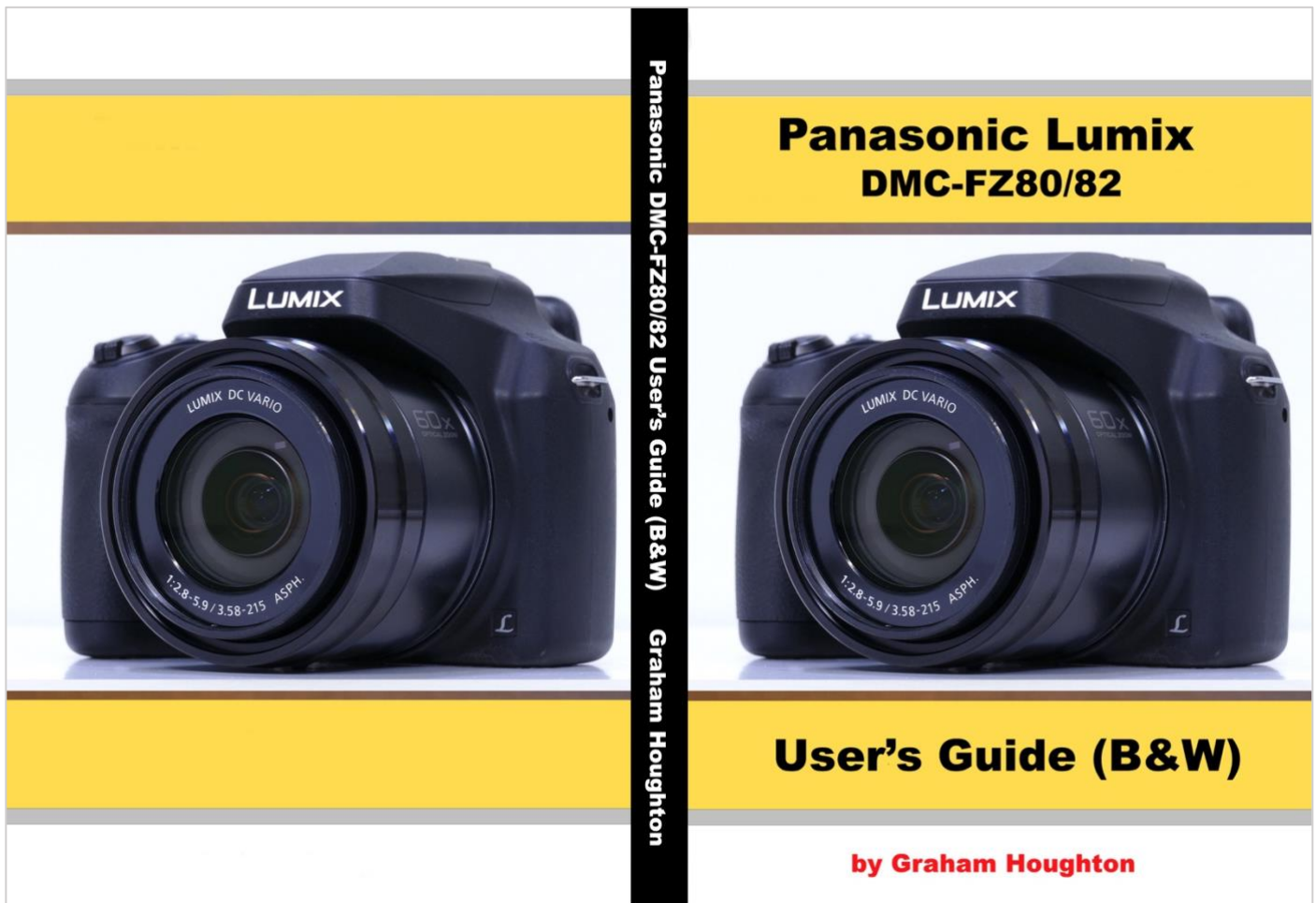
Prize Draw for the FZ1000 USER's Guide Colour Proof Edition

To enter the prize-draw for this fantastic book (closing date 09:00 UK TIME 4th April 2019) click the link below. (only 1 entry per subscriber). Posted to anywhere as soon as possible after the draw.

[Enter me please](#)

Panasonic Lumix FZ80/82 Users Guide

Several subscribers have asked if I would consider writing a guide for the FZ80/82. It would take me around 4-6 months if I put my mind to it. I just wanted to do a quick poll to see if this would be of general interest. Please respond by [clicking this link](#) if you would like to see this guide produced.



I would propose this to be the black and white edition with full colour PDF – what are your thoughts?

Tripod Mounting Plate FZ80/82/300/330/1000/2000/2500



You may remember the Alzo “liberator” plate (which I’m sure was copied from my blog?) for allow these cameras to be used on a tripod and still allow access to the battery compartment. Well I need another couple for my own use and propose to machine a few up. They won’t be anodised just primed and sprayed in black enamel but will have the nickel brass inserts and hex key head fixing screw and anti-rotation pads.

As I must order the aluminium bar for the project if anyone would like to get one of these [click this link](#) to record your interest. The cost in the UK would be £6.25 including first class postage. Cost to other countries would be available on request as I would need to get postal rates etc.

10 Stop ND Filter Calculation

Often in low light with this filter attached there is insufficient light for the camera exposure system to measure scene brightness. Some of the later cameras can measure down to -4EV but most will struggle around 1 or 2EV.

With a 10 stop ND Filter it is best to set manual focus as again autofocus may not work. Once you have focussed set the ISO and Aperture that you want your landscape, seascape or other vista that you may be shooting and then set the shutter speed to give you the mid-point reading on the exposure scale. Take a note of the shutter speed needed. Now carefully screw in the ND filter trying not to disturb the focus position. Now you need to make the necessary exposure correction. The factor is 1000 so for example 1/30 sec becomes 30 seconds. However, if the shutter speed is an awkward number here's my little chart that might help.

shutter speed	10 stop ND
1	1024
1/2	512
1/4	256
1/8	128
1/15	64
1/30	32
1/60	16
1/125	8
1/250	4
1/500	2
1/1000	1
1/2000	1/2
1/4000	1/4

From your initial reading match the new exposure from the right-hand column, the values are in seconds. I've been testing a cheap 10 stop filter against the Hoya Pro ND series.



The results were good and only a slight colour shift that was easily corrected in post processing by using the WB correction tool.

I'll be publishing the trial of this, shortly.

Manchester Photowalk May 2019

In the next newsletter I will hope to have finalised the date/time and details of how to get to Castlefield from the railway stations etc., and then will confirm them with those who expressed interest.