



So in summary, whilst the second generation professional sensor technology in the D2X and the soon to be released prosumer technology of the D200 can offer a lot more than the first generation D100 technology, it comes at a large price and the fundamental question you have to ask yourself is “am I ready?”. I can tell you that I very seriously considered upgrading to the D2X when it was released, but realized that it would be wasted on me as I was not ready for it.

Will I upgrade to the D200? Well probably yes, because I now believe

I am ready for it because I now know the boundaries of the D100 and how to touch them!

So, now that you know just how good the D100 really is it just so happens I know where there are a couple of Subal D10's complete with D100's available.....

Don Silcock

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Book reviews

Manatees: The Gentle Giants

Text by Karen Keberle. Photos by Gregory Sweeney



Manatees are rather like dolphins in that they evoke an emotional response from the general public.

This 72 page 20 x 20cm (8" x 8") book is a visual celebration which will appeal to divers and non-divers alike and I am sure will sell well in the Florida tourist shops where tens of thousands come every year to see these amazing creatures.

Manatees: The Gentle Giants is light on text but heavy on excellent underwater photos by Gregory Sweeney and there are some useful contacts at the end of the book for those wanting to see these animals both in captivity and in the wild.

www.gregorysweeney.com

TTL Flash with DSLR cameras

by Matthias Heinrichs

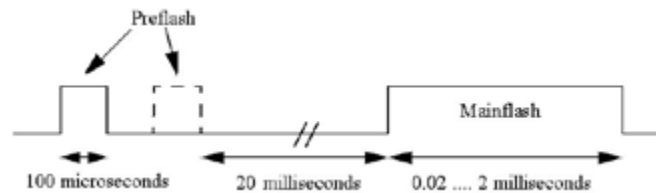
With only one exception (Fuji S2Pro), all digital SLR cameras use a preflash evaluation system for TTL flash exposures. The preflash (or several preflashes) is fired some milliseconds before the shutter opens and the picture is taken.

The mainflash is fired on either at the beginning of the exposure (1st curtain sync) or just before the shutter closes (2nd shutter sync). Usually the mirror is in the normal position during the preflash so you can see the preflash in the viewfinder even if the interval between pre- and mainflash is very short, only 10 milliseconds at a Nikon D50 for example.

The preflash is required due to the fact that a camera CCD or CMOS sensor can not be read out in realtime during the exposure to determine that enough light has been emitted from the strobe and so the strobe can be quenched in real-time.

Old, film-based TTL used reflected light from the film surface to feed a dedicated flash sensor. Silicone sensors do not reflect enough light for this, so light sensors in the swing mirror housing do this during the preflash. If the preflash is fired using a known and constant power level, the camera can calculate the amount of light needed for the actual exposure.

Strobes for TTL used with DSLR cameras need to be capable of firing the low-power preflash, e.g. 1/64 and the mainflash (e.g. 1/256 to 1/1) within a short period of time.



This shows typical timing of a preflash DSLR camera.

To trigger a Xenon flash tube rapidly without damage to the tube and circuitry, it's important to quench the tube very fast and include a trigger circuit to trigger the tube fast enough.

All modern strobes use an IGBT (Insulated Gate Bipolar Transistor) to cut off the high currents of the flash tube. In powerful strobes (400Ws and more) currents can reach more than 500Ampere at 360Volts! Older strobes with SCR (Silicon Controlled Rectifier) quench circuitry are capable of triggering two flashes within 100...150ms - too slow for any preflash DSLR.

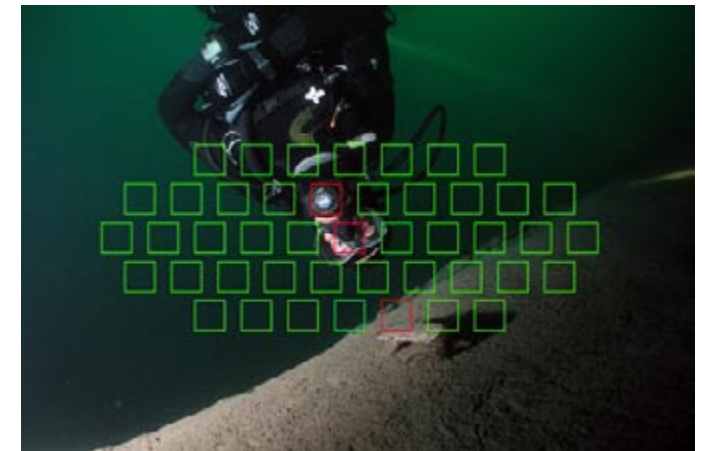
An interval of 5ms makes a modern strobe compatible with nearly all DSLR cameras, e.g. Inon D2000W or Subtronic Maxi TTL. Housed Flash guns will work in TTL, of course but compared to an underwater strobe they do not provide much power and coverage and the controls are not as comfortable as the big knobs and bright LED controls on underwater strobes.

To convert the camera-specific flash protocol to the quasi-standard, old Nikonos system a conversion circuitry is required. This can be integrated in the housing, the strobe or in the sync

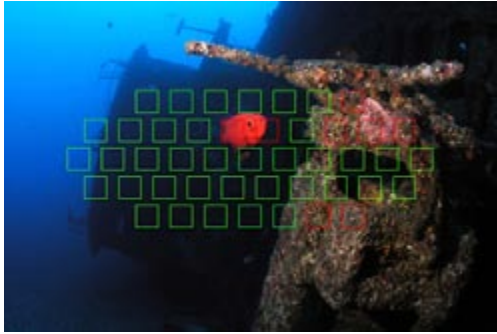
cable between them. A protocol converter for a DSLR is a small microprocessor translating the camera language into the simple flash commands of an underwater strobe.

In normal exposure mode, a matrix metering system is used but the main subject (which is locked with the autofocus) is still an important factor for the flash power.

Without switching to manual flash exposure a subject filling only a few percent of the frame is exposed correctly.



Matrix evaluation, example 1: A dark subject (Diver) with some reflective objects in the AF fields. To avoid overexposure the flash was fired in low power. A conventional TTL system, as in the Nikonos V, would have clipped the highlights on the regulator or in the face.



Matrix evaluation, example 2: The camera did the right decision not to illuminate the wreck because active AF points are on a near subject.

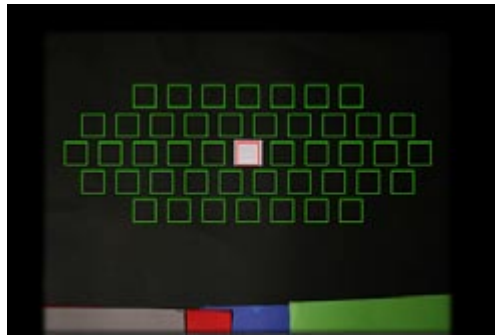
Compared to a simple average from older film cameras even an entry-level DSLR camera uses a sensor pattern of 30-50 sensors for flash exposures. Different manufacturers use different algorithms for their flash evaluation. Besides the information from the preflash, the aperture, focal length, ISO setting and white balance is used to calculate the power of the mainflash. In normal mode, the multi-sensor pattern and the algorithm behind it tries to find a balance between bright and darker parts of the image to achieve a good result. In special modes, like Spot metering, the user can benefit from this complex system.

Flash Exposure Lock (FEL), for example, allows a pre-metering of the subject using only a very small portion of the image. Good if you want a reflective object in blue water

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or in front of a dark background without switching the strobe to manual. After pressing the FEL button (* at Canon DSLR) the camera uses the currently selected AF point to evaluate the flash exposure. The result is stored until you press the shutter so you can reframe your picture and the flash will be fired with the stored power level.

These two pictures show the flash exposure pattern in Canon cameras (Here, a Canon 1D). The metering is set to center, a Subtronic Maxi ETTL is used for this test. A small white sheet is placed in a sheet of black paper.



Spot evaluation, correct exposure. The camera did not try to expose the black background and fired only a small mainflash.



Spot evaluation, overexposed. The same setup but the active AF point is on the black background. The camera tries to expose the black paper to some 18% grey and the picture is heavily overexposed.

As you've probably gathered by now, TTL flash control with DSLR cameras is a very complicated business!

Matthias Heinrichs

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Guidelines for contributors

The response to UwP has been nothing short of fantastic. We are looking for interesting, well illustrated articles about underwater photography. We are looking for work from existing names but would also like to discover some of the new talent out there and that could be you! UwP is the perfect publication for you to increase your profile in the underwater photography community.

The type of articles we're looking for fall into five main categories:

Uw photo techniques - Balanced light, composition, etc

Locations - Photo friendly dive sites, countries or liveaboards

Subjects - Anything from whale sharks to nudibranchs in full detail

Equipment reviews - Detailed appraisals of the latest equipment

Personalities - Interviews/features about leading underwater photographers

**If you have an idea for an article,
contact me first before putting pen to paper.**

E mail peter@uwpmag.com

How to submit articles

To keep UwP simple and financially viable, we can only accept submissions by e mail and they need to be done in the following way:

1. The text should be saved as a TEXT file and attached to the e mail

2. Images must be attached to the e mail and they need to be 144dpi

Size - Maximum length 15cm i.e. horizontal pictures would be 15 cm wide and verticals would be 15cm.

File type - Save your image as a JPG file and set the compression to "Medium" quality. This should result in images no larger than about 120k which can be transmitted quickly. If we want larger sizes we will contact you.

3. Captions - **Each and every image MUST have full photographic details** including camera, housing, lens, lighting, film, aperture, shutter speed and exposure mode. These must also be copied and pasted into the body of the e mail.