

EV Numbers and using a spotmeter

During the May 2003 Light and Land trip to Cornwall, a big debate began regarding the use of spotmeters, and what exactly EV numbers are. During this debate it became clear to me that I didn't really have a clue about all this, so I resolved to find out about it and drop a note to the L&L newsletter. So here goes...

After looking through my fairly large library of photographic books, it soon became clear that nobody else understood either. Those that did try, gave fairly vague explanations, but most avoided the subject completely. My best clue came from "Exposure" the second book in the famous Ansel Adams trilogy.

EV numbers	Aperture													
	1.0	1.4	2.0	2.8	4.0	5.6	8	11	16	22	32	45	64	
S	1	0	1	2	3	4	5	6	7	8	9	10	11	12
h	2	1	2	3	4	5	6	7	8	9	10	11	12	13
u	4	2	3	4	5	6	7	8	9	10	11	12	13	14
t	8	3	4	5	6	7	8	9	10	11	12	13	14	15
e	15	4	5	6	7	8	9	10	11	12	13	14	15	16
r	30	5	6	7	8	9	10	11	12	13	14	15	16	17
	60	6	7	8	9	10	11	12	13	14	15	16	17	18
	125	7	8	9	10	11	12	13	14	15	16	17	18	19
S	250	8	9	10	11	12	13	14	15	16	17	18	19	20
p	500	9	10	11	12	13	14	15	16	17	18	19	20	21
e	1000	10	11	12	13	14	15	16	17	18	19	20	21	22
e	2000	11	12	13	14	15	16	17	18	19	20	21	22	23
d	4000	12	13	14	15	16	17	18	19	20	21	22	23	24

Ansel said: "Although EV numbers bear the same relationship to each other that a meter's arithmetic numbers do, the two are not interchangeable since EV numbers refer to camera exposure settings and meter scale numbers refer to luminance". Although this wasn't completely clear at first - a bit more research (via the web) has helped me finally "see the light" so to speak. Hopefully you can too...



My Sekonic L508 spotmeter

The EV scale was initially created to allow the user to quote a single number to denote a particular shutter speed / aperture combination. The start point was arbitrarily chosen such that EV0 is equivalent to 1 second at F1.0 and all other values are derived from this start point. For example EV15 is equivalent to 1/125 second at f16 OR 1/60 second at f22 OR any other equivalent value that lets the same amount of light into the camera.

Lets imagine a situation where two photographers are facing an identical scene. They both select a mid tone from their subject, and take a spotmeter reading in EVs. Photographer A is using ISO 100 film and gets a reading of EV 12. Photographer B, however, is using ISO 50 film and therefore needs twice as much exposure. Photographer B's meter should there fore give an EV of 11. This is where the confusion arises. Both photographers are pointing their meters at the same subject under the same lighting conditions, but get apparently different readings!

What is even more confusing is that not all spotmeters follow this logic. Pentax digital spotmeters are calibrated for ISO100 - it is only when entering the film speed on the scale round the lens that the shutter speed/aperture combinations are changed. Consequently the Pentax meter will always give the same value for EV regardless of the film speed being used. My Sekonic L508 meter does the calculation for you and will change the EV number depending on the film speed.

To try and explain the sentence in Ansel's book, EV numbers are fine when compared to each other, but as soon as you wish to include the luminance of the subject in the equation, you MUST take into account the film speed in use - without it the particular EV number is meaningless.

It is also vital to understand not only the EV scale, but also the way that your lightmeter interprets it. In the practical example above, lets assume that photographer A is using a Pentax meter and ISO 50 film. His meter gives a reading of EV15 which equates to 1/125 second at f16 on the EV scale. By inputting the film speed of ISO50, however, his meter interprets EV15 to mean 1/60 second at f16. Photographer B is using a Sekonic L508 and the same film. His meter will read EV14 which equates to 1/60 seconds at f16 on the EV scale and doesn't need the second layer of interpretation. Although the two photographers have metered different EV values, both end up with the same settings to apply to their camera!



*Dead Horse Point, Utah
Ebony SV45te*

Confidence in your spotmeter is vital in situations like this where 5 stops of ND Grad were used

One other thing - camera and lightmeter manufacturers often indicate the sensitivity of auto exposure and auto focus equipment in EVs. For example a SLR camera's lightmeter might be quoted as being sensitive between "EV1 to EV20 at ISO 100 and f/1.4". Notice we now have another qualifier to this statement - we now have to quote the speed of the lens in use as well! The statement actually means that if you mount an f1.4 lens and set the film speed to ISO 100 - this camera's meter will be accurate between EV 1 and 20. If, however, you mount an f2.8 lens, the lightmeter will see one stop less light and therefore will only be accurate between EV 2 and 21.

A good way to try and avoid any confusion is to use the term "LV", Light Value to represent the luminance of the subject. "LV" can then be Universal and mean the same thing to all of us. Some examples of LV might be :

- LV13 Typical shadow cast in a daylight scene; cloudy bright days
- LV7 Typical indoors, light outdoors about 10 minutes after sunset
- LV2 Typical night street scene

All we now need to understand is how our particular meter maps its EV range on to the universal LV range for the particular film speed in use - easy eh?

Author: Phil Malpas – Phil Malpas Photography December 2004

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