

Tech Note.

Disclaimer: some of these may be like teaching your grandmother to suck eggs (I'm not sure my grandmother ever sucked eggs...!), but hopefully some will help you understand more photographic and high speed camera terms and techniques.

Framing Rate vs. Shutter Speed

Framing rate is the number of images that the camera captures in one second. A higher framing rate will result in a greater degree of slow motion effect.

Standard video cameras capture at 25fps (frames per second), and play back at the same speed – hence normal motion is replayed. High speed cameras capture at high rates. For instance, if a sequence is captured at 1000fps, then replayed at 25fps, the action will be slowed down 40x.

Shutter speed (also known as exposure time) is the amount of time each frame is exposed to light. A shorter exposure time will result in less motion blur on each frame. However, the less time the frame is exposed, the more the quantity of light that is required. This can either be by increasing the intensity of light, or using a wider aperture (come back next week for a tech note on aperture). Shutter speed equally applies to stills as well as video/ high speed cameras.

On a high speed camera, the exposure time can be anything between the inverse of the framing rate (eg 1/1000s for a framing rate of 1000fps) and the minimum the camera is capable of (1 microsecond in the case of all IDT cameras). A good starting point to use would be to use an exposure time of half the interframe time (ie 1/2000s at a framing rate of 1000fps).

Notation. Exposure time (or shutter speed) can be quoted in a few different ways. All of these examples represent the same setting, and are for a framing rate of 1000fps.

- Fractions of seconds (eg 1/2000s)* preferred typically by photographers
- Microseconds (eg 500 μ s)* preferred typically by scientists
- Shutter angle (eg 180 degrees)* preferred typically by videographers
- Shutter ratio (eg 2x) preferred by some people!

IDT software (both [MotionStudio](#) and [MotionInspector](#) can show exposure time in any of the first three above

More information?

sales@idtvision.co.uk

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