



Why should you choose to use an Image Intensifier on a High-Speed camera?

The use of an Image Intensifier allows you to expand the use of the camera in several ways. The most important ones are listed below:

1. **Allows the camera to see outside the normal spectral range of the camera.** For example the image intensifier's Photocathode can be made to see into the Ultraviolet. The somewhat standard range for the intensifier's Ultraviolet spectral range is from 200 nm to 700 nm. Other Ultraviolet Photocathodes can see even lower in the Ultraviolet. There are Photocathodes that can be made to see below 200 nm. Some of these are also Solar Blind, in other words they can see little if any visible light. Their range is from 160 nm to 320 nm.
2. **Reduce Exposure Time.** Using the unique ability of the image intensifier to be gated, the exposure time per frame can be reduced to nanoseconds. Gating is achieved by back biasing the Photocathode to turn off the flow of electrons from the Photocathode. The image intensifier is gated in sync with the frame rate of the camera well into 200,000 frames per second and above. Gate speeds in the order of 2 to 3 nanoseconds can be achieved. Some of the standard units operate at a 50 ns minimum. There are many applications where reduced exposure time is necessary. Some of them are when looking at explosions and astronomical phenomena.
3. **See Low Light Levels.** There are many applications in which the available light level is not high enough to allow the camera to see it. Such as when a fluorescence is induced with a laser and the light produced is too weak for the camera to see. Other applications for High-Speed imaging may be where the light needed to produce an image on the camera may damage the object being looked at through heat from the light. Combustion research is one application that needs the use of an image intensifier because the light produced by the laser fluorescence is too weak to see. Other obvious applications are where it is impractical to produce the illumination required by the camera such as in microscopy.

There are many versions of image intensifiers produced with a wide range of Photocathodes providing a spectral response from 160 nm to over 1100 nm. Most all of the image intensifiers produced for use in High-Speed cameras have phosphors on their output that have a very low persistence in other words that decay very rapidly so that the image from the previous frame is not in the present frame of the camera. Usually they are supplied with either a P-24 phosphor good for about 100 to 200+ thousand frames per second or a P-46 phosphor good for extremely high frame rate.