Back-to-back Strobe Function

What is Back-to-back strobe?

GEViCAM platform provides back-to-back strobe function as the standard. This is function to create double strobe pulses per trigger input and outputs two consecutive frames. Two strobes are positioned before and after the transfer gate pulse, which is a gate pulse to transfer photodiode charges to CCD shift registers once a frame. The first strobe generates and outputs the first frame image right after the trigger. The second strobe is still very close to the first one (20 to 40 µs apart) but it creates second frame image. Therefore, one trigger generates two consecutive images with back-to-back strobes. Since each strobe faces to own task (image), it is called back-to-back.

GEViCAM features

GEViCAM platforms (GP-series and GD-series) provide the back-to-back strobe functions as the standard. The first strobe is fixed at right after the trigger and discharge pulse (second H from trigger edge). The second pulse position is programmable by 1H (=horizontal clock = 20 μ s for VGA, 40 μ s for SXGA) interval and the minimum number is 4H.

Therefore, GEViCAM back-to-back strobe is very flexible and useful to many applications.

Pulse Timing

Async Trigger	
Internal H sync/LVAL	
Discharge Pulse	1
Strobe Pulse Dutput	Ist Pulse (fixed) Variable 2nd Pulse
Transfer Gate	3 1/2H 8H (default)
Minimum Pulse Interval	

GEViCAM has capability to reset internal H and V sync in pixel clock level (4 clocks) after the external trigger. With the trigger, it generates a discharge pulse to purge electrons in photodiode area which are accumulated in previous frames for unknown period. In this mode, first transfer gate, which transferees photo-charges to CCD shift registers, occurs at middle of 3rd H period. The first strobe output is set on second H from the trigger. The second pulse is variable but the it must be after the discharge pulse to generate two consecutive frames per trigger. The shortest number is 4 (H) and the maximum duration is 1 frame period (i.e 494 for VGA, 1040 for SXGA).

The control register is 57 00 25 00 00 xx yy (Hex).

Image Capture

🛔 Coyote	I wo consecutive im-
File IP Engine Camera Tools Help Connection Acquisition Image Saving Diagnostic	ages are taken with
Continuous Fixed Number of images Continuous	using "Image Saving". The acquisition can be kept continuous and after trigger, just start two images saving as shown left. These two
File Formats O Text file with acquired image IDs	
Haw data mes Windows BMP files Movie	
Codec File location or name C.\Documents and Settings\Toshi Hor\Desktop	images are one frame apart but images are
Controls Stat Stop Progress	frozen by the strobe lights at almost same

Applications

Back-to-back strobing is very useful tool for various image capturing applications.

The typical use is to measure **particle velocities and trajectory** with known strobe intervals. Since the interval is accurately controlled, the analysis is easily done. This is also useful tool to freeze fast moving objects with **different lightings**. For *glass bottle inspection*, one strobe is front lit and second strobe is back lit. Short wave spectrum (blue or violet) for shallow surface and IR for deeper *surface inspection*. Two separate LED light source to *analyze color* of objects, color letters on *license plate*, etc.

As the option, long interval beyond multiple frames can be implemented to measure *traffic speed violation*. Since first strobe is synchronized with the trigger timing, single second pulse output version is available as a custom option.

Note: Back-to-back strobe is strobe light application and camera exposure is wide open during the image capture. Therefore it is important to keep background dark in this application.

Example circuit of separating double pulse.

