Internal Self-Triggering Using the PLC Function

### Self Triggering of GP-series Cameras

GP-series GigE cameras have built-in PLC (GPIO) control functions.

Since cameras are designed to perform many tasks used in industrial applications, the trigger function has various no-delay trigger functions.

The trigger signal is typically required from external trigger devices or PCs. However, it is convenient to provide self triggering capability to demonstrate various triggered events without the need for external signals.

PLC Functions

In configuration menu, you will see the IP Engine tab and Programmable Logic Control section.

This PLC function is quite powerful and it is capable of performing many high level functions used in factory automation. Self triggering is one of the simplest applications.

For general description and PLC Block connections, please refer page 24 of GEViCAM manual.
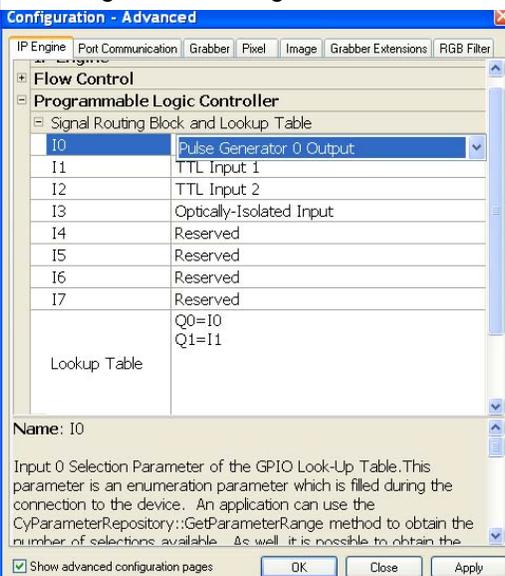
Pulse Generator

Here, a pulse generator is used to generate self triggering. Click "I0" pull-down list and find "Pulse Generator 0 Output". "I0", which is originally connected to external trigger will now be connected to the internal pulse generator "0" output.

In LUT (Look up table), type Q0=I0. Inside camera, Q0 is the node connected to internal trigger circuit. So, the pulse generator output is connected to the trigger input in the camera. In this example Q1=I1 is shown. This is not essential but you can observe internal camera reset timing by monitoring the green wire out of the GPIO connector (pin 3). Q1 is the "internal exposure signal monitor" node and is now connected to internal strobe output pulse.

Click "OK".

Programming Pulse Generator

There are two ways to control the pulse generator. In the same PLC menu, you will see "Enhanced Function Block". Open "Pulse Generator 0". It shows the pulse form and unit (granularity) in ns. One unit is 30ns. Make sure that "Periodic" is marked to generate repetitive pulses. If you want single shot, you need a different triggering method. Since it is internal self triggering without any synchronization with external signal, the trigger mode is "Triggered on low level".
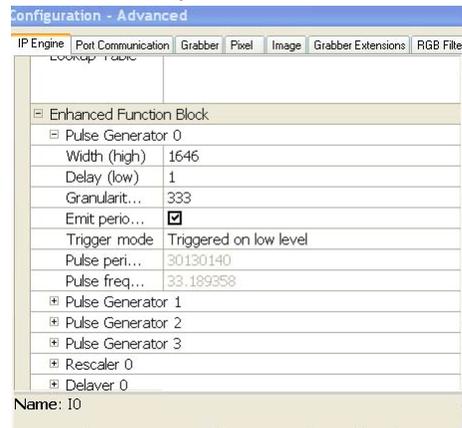
Once the basic settings are done, the pulse duration can be controlled from the slide bar in "Pulse Generator" dialog from IP Engine of main application window.

This example indicates 30 frame/sec reset pulses.

Example of self triggering (Port Communication)

Long exposure: Select Async mode (57 00 23 00 00 00 01) then control exposure (57 00 24 00 00 xx xx). This allows longer exposure than one frame.

Pulse width control: Select the mode (57 00 23 00 00 00 02). You can move the slide bar of "Delay" to see the exposure changes.

ITS mode: Select ITS mode (57 00 23 00 00 00 04) and get 3 frames per trigger (57 00 29 00 00 00 03). You can change each shutter speed by selecting 1st exposure (57 00 24 00 00 00 xx), second exposure (57 00 27 00 00 00 yy), third exposure (57 00 28 00 00 00 zz). In this mode, you may need a relatively long interval for the pulse generator (>0.5 ms).