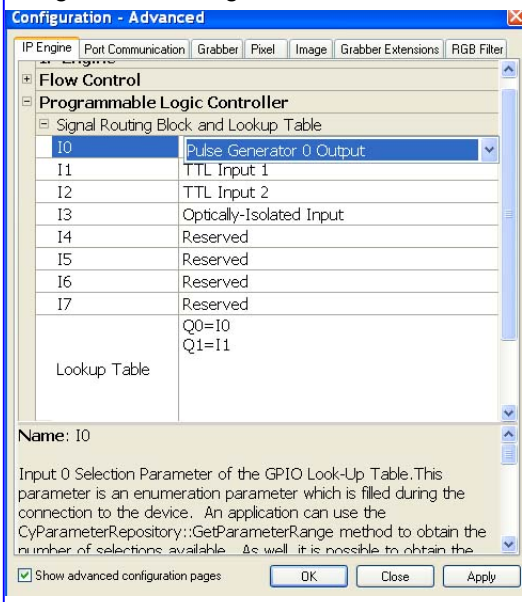
Internal Self-Triggering using PLC Function

Self Triggering of GP-series Cameras

GP-series GigE cameras have built-in PLC (GPIO) control functions.
Since cameras are designed to perform many functions 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 external signals.

PLC Functions

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



This PLC function is quite powerful and it is capable to perform many high level functions used in factory automation field. The self triggering is one of the simplest application.

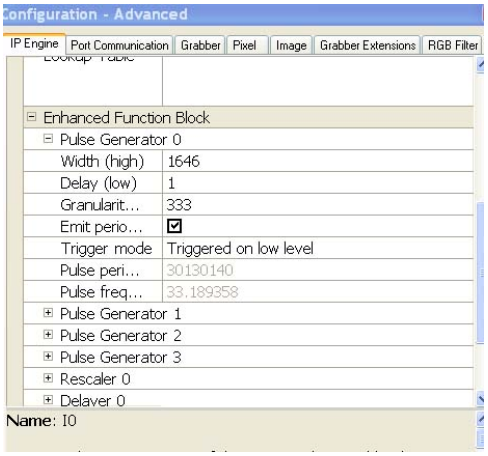
For general description and PLC Block connections, please refer page 24 of GEViCAM manual.

Pulse Generator

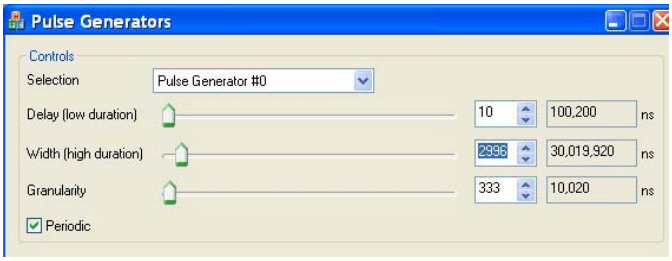
We use a pulse generator to generate self triggering.
Click I0 pull-down list and find Pulse Generator 0 Output. I0, which is originally connected to external trigger is now connected to the internal pulse generator “0” output.
In LUT (Look up table), type Q0=I0. Inside camera, Q0 is the node connected 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 see internal camera reset timing by monitoring the green wire out of GPIO connector (pin 3). Q1 is “internal exposure signal monitor” node and 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 marking on “Periodic” to generate repetitive pulses. If you control single shot you need additional trigger method. Since it is internal self triggering without any synchronization with external signal, the trigger mode is “Triggered on low level”.



Once the basic setting is 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 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 relatively long interval of pulse generator (>0.5 ms)