## Opto-isolated IO for Trigger Input

### GPIO: Opto-isolated IO

The GP series GigE cameras are equipped with a Programmable Logic Controller (PLC) that provides powerful General Purpose IO (GPIO) functions. The GPIO connector is 14-pin MDR and comes with one set of TTL (input and output), one set of Opto-isolated differential IO, RS-485 based serial communications and an Audio CODEC input and output.

The opto-isolated IO is user selectable for one input / one output, or two inputs or two outputs. The factory default is one input and one output.

### Trigger input from Opto-isolated input

The standard trigger is TTL input through pin-9 of the GPIO connector. The same trigger can be achieved by using the Opto-isolator with a long twisted cable. This allows balanced differential input, noise suppression and other advantages.

In this Tech-note, trigger input via the Opto-isolated Node will be discussed.

### Full Function GPIO Cable

The GP series GPIO connector is a standard MDR-14, and the mating connector can be purchased through 3M distribution. The solder-cup plug is Part Number 10114-3000PE. High quality industrial GPIO cables are also available from Intercon 1. Please refer page 30 of the GEViCAM manual. The following discusses only the wires and pins related to trigger input:

The Opto D1 (Opto-isolated input node) is using pin-5 for Input(+ )and pin-11 for Input(-). The cable is one twisted pair with Orange/White stripe for Input(+), and solid Orange for Input(-).

The original TTL input for trigger is Orange coax with the core connected to pin-9 and the shield ito pin-2.

After power up and connection of the GigE camera and PC with Coyote application (SDK), the trigger input needs to be switched from the Orange coax to Orange stripe twisted pair.

### Coyote application

First, start connection and Coyote application, referring to the manual or quick installation guide. Make sure the camera displays images. Go to "Configuration" button at lower right and open "Port Communication" tab.
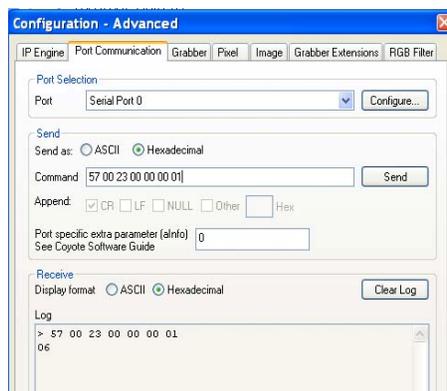


Mark Hexadecimal indicators (two locations). Type in command "57 00 23 00 00 00 01" and send.

This causes the mode to change from normal continuous images to Async (triggered) image capture. Without external triggers, image freezes. If you have a TTL trigger signal for bench test, connect it to the Orange coax. Image capturing starts with the trigger because the factory default is TTL trigger input. If you choose mode "57 00 23 00 00 00 02", it will be pulse width control and by changing the trigger pulse width, the image brightness changes as the exposure varies.
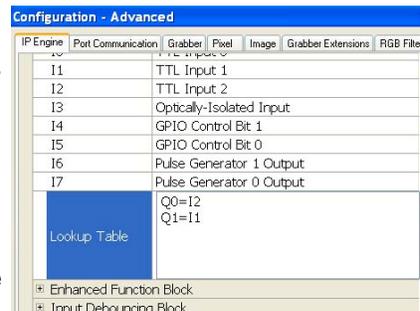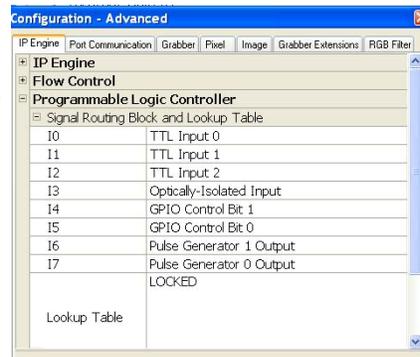


### PLC

Now, the Opto-isolated input will be used. The Internal PLC function allows such node selections easily.

In PLC block (see page 24 of GP series manual), the trigger signal to internal circuit must be Q0. Input node for TTL trigger is I0, Opto-isolator input is I2.

Now open up the same "Configuration" dialog and open the IP Engine tab. You will see "Programmable Logic Controller". Open further to see "LUT" (Look up table).



Each signal routing has to be assigned. For this application, you do not have to change the assignment. I0, I1 and I2 show TTL Input but internally they are all TTL regardless of whether inputs are pure TTL or opto-isolated.

Go to LUT. It shows LOCKED but you can overwrite new LUT. Type Q0=I2, also keep Q1=I1 to monitor exposure pulse in TTL (this part is the same as the factory default). Click "OK".

You can now send the trigger through the Opto-isolated pins.

### Saving the program to internal flash memory

The LUT program can be saved for next power up default. After confirming the functions, close the "Configuration" dialog and open IP Engine tab of Coyote application. You will see the pull down menu of "Save device configuration to flash". Click OK and mark "Save State to flash". The next time when you power up, the device will be ready for Opto-isolated input. However, camera configuration (mode) must be reset in this program.

*GEViCAM*: A GigE Vision Camera Company

## Opto-isolated IO for Trigger Input

You need to send again the same command as shown
to the left.

*NOTE: Signal polarity changes when it goes through
opto-isolator. Please make sure negative going edge
of TTL trigger is equivalent to positive going edge of
opto-isolator input.*