

Opto-isolated IO for Trigger Input

GPIO: Opto-isolated IO

GP series GigE cameras are equipped with powerful GPIO (General Purpose IO) functions called PLC (Programmable Logic Controller). 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 base serial communication and 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 GPIO connector. The same trigger can be achieved using Opto-isolator with long twisted cable, different input potential, noise suppression and other advantages. In this Tech-note, we will cover the trigger input via opto-isolated node.

Full Function GPIO Cable

GP series GPIO connector is standard MDR-14 and anyone can purchase the mating connector from 3M distribution. The solder-cup plug is 10114-3000PE.

If you need better industrial cable, Intercon 1 has the GPIO cable. Please refer page 30 of GEViCAM manual.

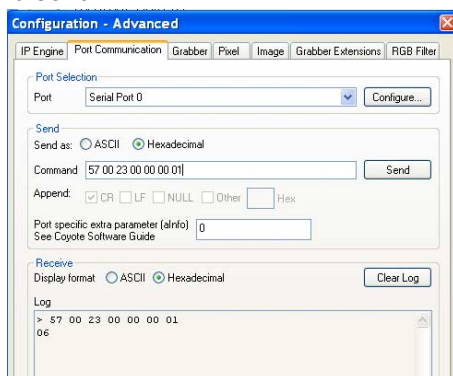
Here we will use just related wires and pins. The Opto D1 (Opto-isolated input node) is using pin-5 for Input+ and pin-11 for Input-. The cable is assigned to use one twisted pair and Orange/white stripe for Input+, solid Orange for Input-. The original TTL input for trigger is Orange coax and the core is connected to pin-9 and the shield is pin-2.

After power up and connection of GigE camera and PC with Coyote application (SDK), we will switch the trigger input from 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 up "Port Communication" tab. Mark Hexadecimal indicators (two locations). Type in command "57 00 23 00 00 00 01" and send.

This makes mode change from normal continuous image to Async (triggered) image capture. Without external triggers, image freezes. If you have trigger signal of TTL (bench test), connect the trigger to Orange coax. Image



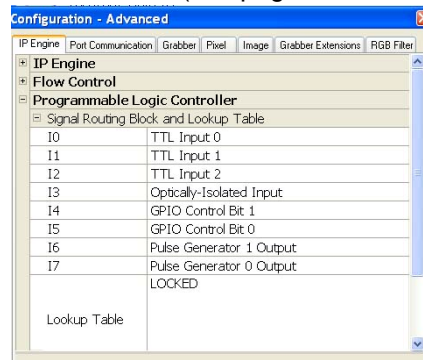
capturing starts with the trigger as factory default is TTL trigger input. If you choose mode "57 00 23 00 00 00 02" it will be pulse width control and by changing the trigger pulse width, the image brightness changes as the exposure varies.

PLC

Now, we have to use an Opto-isolated input.

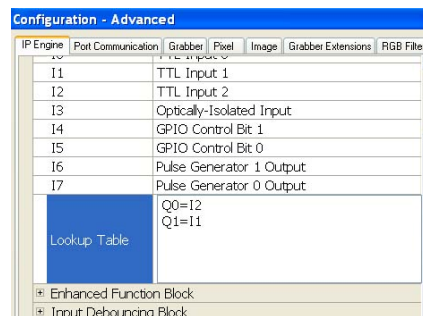
Internal PLC function allows such node selection easily.

In PLC block (see page 24 of GP series manual), the trig-



ger signal to internal circuit must be Q0. Input node for TTL trigger is I0, Opto-isolator input is I2.

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



We have to assign each signal routing. 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 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 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". Next time when you power up the device will be ready for the Opto-isolated input. However, camera configuration (mode) must be reset in this program.

You need to send the same command as left again.

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.