



## **APPLICATION NOTE**

### **GETTING THE MOST OUT OF YOUR TRIGGER BOX**

#### **PROVIDING POWER:**

The trigger box can be powered from an 8V-12V DC power supply. This is the same power supply that can be used to power a QImaging camera.

**DO NOT EXCEED 12V ON THE DC SUPPLY. THERE IS NO PROTECTION CIRCUITRY.**

**THE DC SUPPLY IS POLARIZED: POSITIVE TERMINAL ON THE INNER CIRCUMFERENCE AND THE GROUND TERMINAL ON THE OUTER CIRCUMFERENCE OF THE BARREL PLUG.**

#### **CONNECTING TO THE CAMERA:**

The trigger box is connected to a QImaging camera using a QImaging trigger cable. This cable provides a straight through connection from the 6 pin DIN connector of the trigger box to the 6 pin circular DIN connector of the camera.



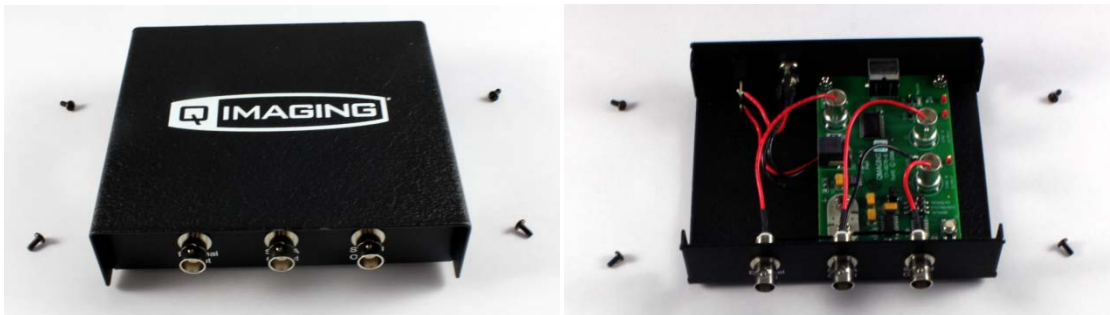
## TRIGGER MODES:

Your imaging software has the capability of selecting an external trigger type (edge, pulse, and strobe – see your camera manual for detailed descriptions), allowing you to utilize your trigger box to source the signals for this type of operation.

By default, the trigger box supports the use of an *external* signal to drive a QImaging camera. However, the trigger box electronics can provide source signals in two other ways. These modes are selectable on the circuit board within the trigger box housing.

**In order to access the trigger source switches in your trigger box, you'll need a small Phillips screwdriver.**

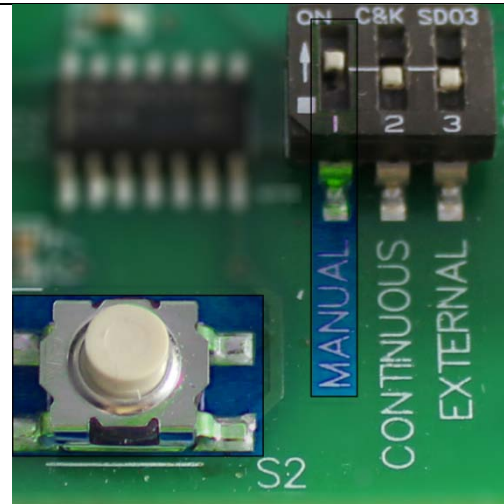
Remove the four screws securing the cover to the rest of the box: two on the left and two on the right. Then, remove the cover to reveal the circuit board.



The circuit board has a DIP switch (part label *SI*) with three settings, and the upward-toggled switch is the current selected mode.

## Manual Trigger Mode

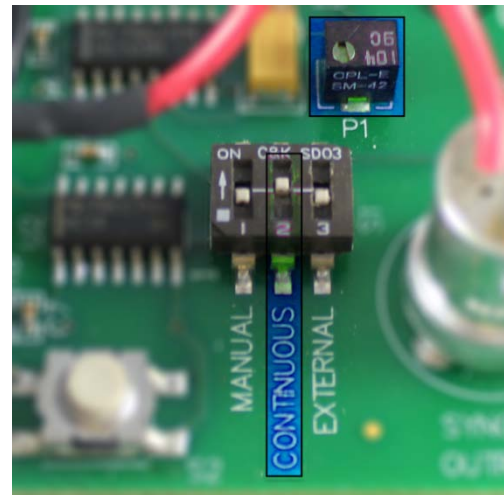
Slide the switch in position 1 upward and turn off positions 2 and 3. The trigger pulse is created by manually pressing and releasing the momentary switch labeled S2.



## Continuous Trigger Mode

Slide the switch in position 2 upward and turn off positions 1 and 3. The trigger pulse is then generated continuously from an internal timer circuit, and the frequency of this pulse can be adjusted via a small flat-head screw on the potentiometer labeled P1.

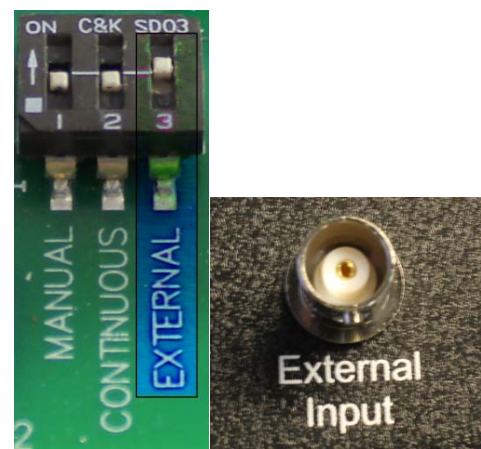
If your camera is not triggering in this mode, the frequency adjustment may be too short – adjust the screw until triggering resumes.



## External Trigger Mode (default)

Slide the switch in position 3 upward and turn off positions 1 and 2. An external trigger source can be supplied through the BNC connector labeled *External Input*, using 5V TTL signals.

It is advised that you do not exceed the maximum input voltage of 5.5V with the external pulse. Also ensure the external pulse signal can source to a 75Ω load; most 5V TTL control devices meet this criterion.





## OUTPUT SIGNALS:

### SYNC A:

This signal indicates when the camera is digitizing and reading out an image, where the width of the pulse corresponds to the readout time. This signal is actively high.

A user could monitor this signal as a means of knowing when to trigger the next frame.

### SYNC B:

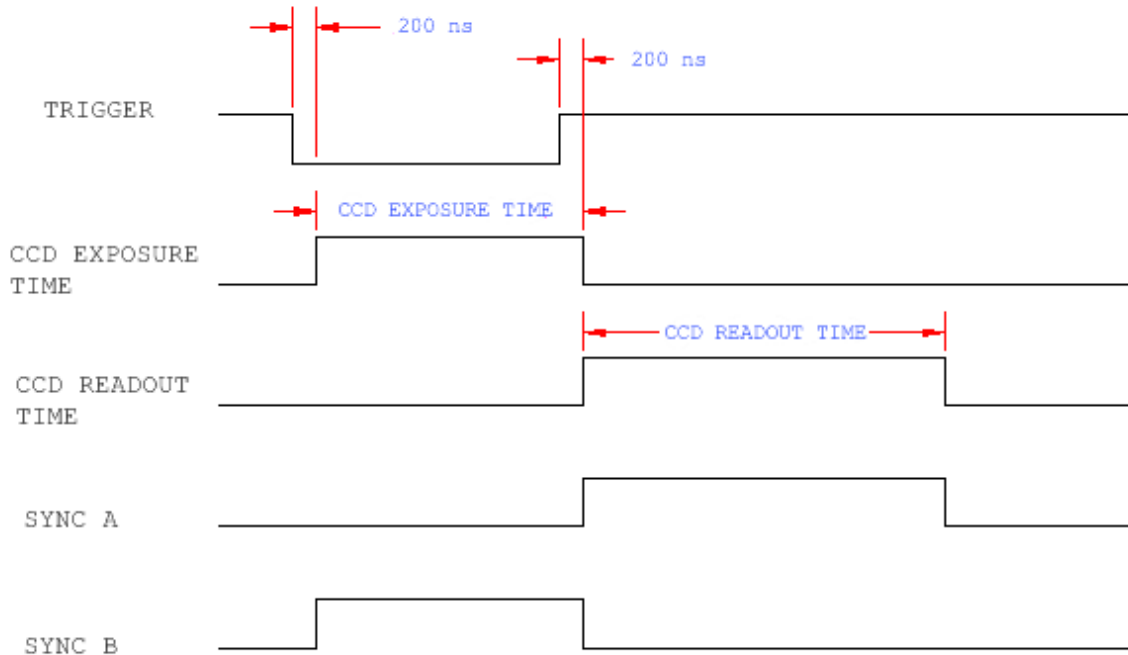
This signal has two modes of operation which can be selected in software.

**Expose mode:** If this mode is selected, the signal will indicate the exposure pulse of the camera. This signal is active high and may be used to synchronize an external shuttering device.

**Trigger mask mode:** If this mode is selected, the signal will indicate the time when a trigger will *not* be accepted by the camera. This signal is also active high.



## EXAMPLE SIGNAL DIAGRAM:



**SEE ALSO:** For a hands-on video tutorial about setting up your camera and software for triggering, visit QTube at [www.qimaging.com/qtube](http://www.qimaging.com/qtube) and search our videos for keyword “triggering”.