External Q-switch Control

The Lee Laser Q-switching system offers considerable flexibility for external (remote) control of Q-switch operation from a customer-supplied computer. There are two (2) means by which the Q-switch may be controlled:

1. Gate Control:

Q-switch frequency is manually set on the front panel of the Q-switch driver. The computer sends a 5-vdc signal to the Q-switch driver to "gate" series of pulses. The laser will emit laser pulses as long as the "gate" signal is present. When the "gate" signal is removed, laser emission stops. For applications such as laser marking (engraving), the "gate" signal would be present for each stroke of a character.

First pulse suppression (FPS) is automatic. However, a 750-µs (nominal) delay is required after the "gate" signal is removed to "reset" the FPS. Therefore, the following marking stroke must be delayed by this period of time. This limits the marking speed of the laser because of the time delay between each marking stroke to reset the FPS.

2. Pulse Control:

The computer generates a signal pulse to control the emission of each laser pulse. The computer can control the pulse rate of the laser. Each signal pulse should be > 10-µs. Triggering is from the leading edge of the signal pulse.

FPS can be by either of two (2) means:

a. Automatic: At the rear of the Q-switch driver, a jumper cable is connected between the **EXT FIXED** BNC connector (input of the pulse modulation signal) to the **FPS** BNC connector. First pulse suppression (FPS) is automatic. However, a 750-µs (nominal) delay is required after the last trigger pulse of each character stroke to "reset" the FPS. Therefore, the following marking stroke must be delayed by this period of time. This limits the marking speed of the laser because of the time delay between each marking stroke to reset the FPS.

b. Separate Trigger Signal: Your computer sends a separate FPS trigger signal pulse to the laser whenever FPS is desired. The FPS trigger signal pulse should precede the beginning of each character stroke by 40-µs. There is no FPS "reset" delay. Marking speed can be much faster because there is no delay between marking strokes.

Note: To prevent unintended and unwanted (false) triggering from external electrical noise sources, the interface circuit has been designed to require a minimum input signal current of 40 mA into a 220-ohm load from the user’s computer.