

# LASERPULSE™ Synchronizer Model 610034

***This versatile, computer-controlled synchronizer provides full automation for PIV measurements.***



### Features

- Multiple-camera support
- Programmable through serial interface
- External trigger input (for phase-locked or single-trigger events)
- Trigger signal output for synchronized events and external devices
- Flashlamp/Q-switch trigger for Nd:YAG lasers
- Trigger signal for camera and camera interface

### Introduction

The Model 610034 LASERPULSE Synchronizer from TSI is a sophisticated, programmable master control unit designed for use in Particle Image Velocimetry (PIV) applications. Acting as the master controller for system components, it automates control of the timing between laser pulses, camera, camera interfaces and any external device during system set-up and image acquisition.

The Synchronizer enables the system to be completely computer-controlled via a serial interface. Signals for the laser flash lamps and Q-switches, the

camera and the frame grabber are generated and automatically synchronized for effortless image acquisition.

For PIV, pulse delay time and the time between pulses necessary to collect frame-straddled images, are controlled via TSI's INSIGHT™ software. The Synchronizer comes complete with power supplies for multiple CCD cameras (for expanding to stereoscopic PIV) and has an auxiliary output for controlling various devices in an experimental rig.

For periodic flows, where phase-locked velocity measurements are desirable, the LASERPULSE Synchronizer can be externally triggered using a TTL signal from the experimental apparatus. Delay times can be set via the INSIGHT software to facilitate PIV measurements at specific phase angles. Image capture at multiple phases of a flow cycle also can be accomplished through batch mode acquisition automatically.

## How it Works

The Synchronizer is programmed (using the selection of parameters in the software) to provide the appropriate laser pulse energy, pulse delay and other operational parameters for generating the best image field. It is generally used with TSI cameras to capture sequential frames, using the frame-straddling technique, with minimum time between frames of 200ns.

Trigger signals from the Synchronizer control the sequencing of the Nd:YAG laser so the laser pulses are triggered in the appropriate frame(s) in the CCD camera. Processing techniques in the INSIGHT software package are applied to the captured frames to provide the velocity vector field and related flow properties.

For periodic and pulsed spray applications, phase-locked measurements are obtained by triggering the Synchronizer using an external trigger signal from an experimental set-up. Delay times to trigger the laser pulse can be selected using the software to collect image fields at fixed delays after the spray is pulsed.

The Synchronizer supports most high-power Nd:YAG lasers as well as mini-Nd:YAG lasers. It also supports a large number of cameras for image capture.

With computer control of Synchronizer settings, system optimization for PIV measurements becomes nearly instantaneous.

## Specifications

### Model 610034 Synchronizer

<b>Minimum frame straddling time</b>	200 ns
<b>Output/input signal</b>	Programmable TTL
<b>Weight</b>	7 lb. (3.2 kg)
<b>Dimensions (H x W x D)</b>	4 × 11.5 × 10 in. (10 × 29 × 25 cm)
<b>Input voltage</b>	100/110/220/240 VAC, 50-60 Hz

Specifications are subject to change without notice.



*TSI Incorporated*

**Corporate Headquarters—Tel:** 651 490 2811 **Toll Free:** 1 800 874 2811 **Fax:** 651 490 3824 **E-mail:** [fluid@tsi.com](mailto:fluid@tsi.com)

**China: Tel:** +86-10-8260 1595 **Fax:** +86-10-8260 1597 **E-mail:** [tsichina@tsi.com](mailto:tsichina@tsi.com)

Contact TSI or visit [www.tsi.com](http://www.tsi.com) for information on specific office locations worldwide.

