

MicroPulse 725 Synchronizer

MicroPulse 725 is a proprietary design, programmable, high-precision master timing controller. It acts as a master to synchronize the timings of multiple system hardware and software components during the undergoing experiment. It offers up to 8 separate output channels and 2 external input hardware channels for phase lock with the unprecedented accuracy of 0.25ns. Its programmable trigger logic timing with hardware and software settings, allows a single MicroPulse725 to control the timing and support the entire PIV system. It uses USB2.0 interface to communicate with the computer and Microvec software.



Innovative software and hardware control design

MicroPulse725 is a programmable controller using combination of software and hardware to operate. It has a built-in communication module with C language-based software control. The trigger signal timing is designed to be control from the PC to give the users wide signal control options. By connecting it via USB2.0 cable to the computer USB port, user can control of the entire synchronizing functions and timing through complex trigger and logic circuitry, all of the functions do not need for hardware jumpers or switches, everything is in the hands of MicroPulse725 software.

Functional integration design

MicroPulse725 can control and synchronize the timings on multiple digital cameras, trigger pulse lasers, shutters, coils, switch controllers and a variety of other devices. Eight channels can be independently programmed with the clock delay trigger or with different trigger logic. All time and/or logic parameters are software programmable with the unprecedented accuracy of 0.25 ns or 0.1 ns.*

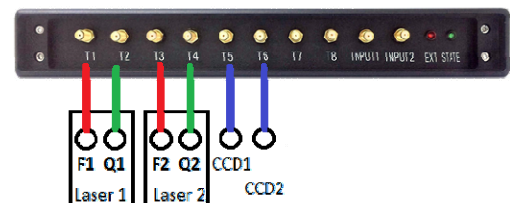


Fig. 1. Double Pulse laser control.

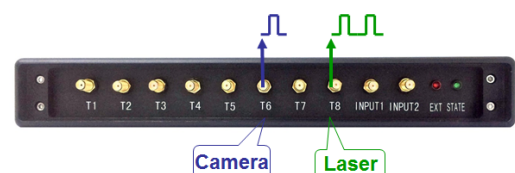
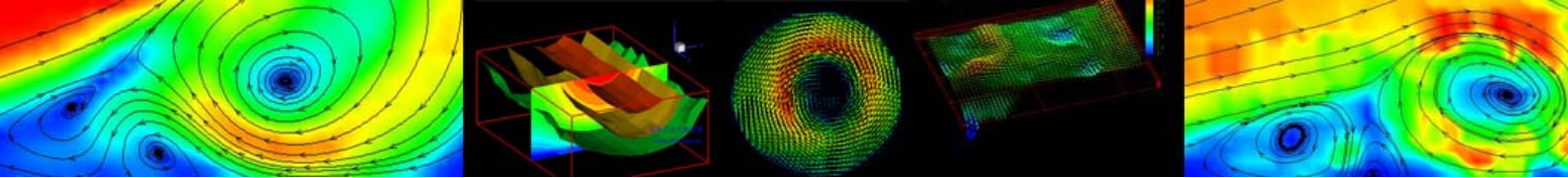


Fig. 2. Continuous Wave laser control.

Beyond the ordinary signal generator:

MicroPulse725 has an outstanding performance and its design is an improvement compared to the ordinary signal generators. It utilizes a specialized programmable control array processing chip, with all input and auxiliary output signal being processed in parallel within 1ns range. Its software allows complete computer control for each channel and can set it to work in different complex control modes:



Synchronous operating mode: the entire system works based on TTL signal output within the cycle set by the software, with the adjustable operating continuous frequency from 1Hz to 1000kHz

External sync mode: the system automatically monitors the external input sync signal and by measuring and analyzing it, and then through the internal firmware to set the hardware logic control signal output of each channel according to the parameters pre-set by the software.

External trigger mode: the system automatically monitors the external input trigger signal, and it adjusts (phase locks) each channel to it adding values defined by the software within the synchronization parameters until the software is set to stop working.

Flexible parameter settings: software sets the rising or falling edge of the system output pulse, the pulse width can be defined and modified by software.

Common USB interface control: the latest low-power hardware circuit design, allow the entire system to be connected via a USB cable to the computer power supply, and communicates and be controlled through software.

Pulse delay control: 8-channel output pulse can be set to a certain delay (1ns to 1s), and then output can be set to a certain width of the pulse signal (1 ns to 1 s).

Simple software programming

MicroPulse725 control software is designed to help setup complex logic control. Windows-based user interface design allows step by step operation for flexible settings of each channel separately. Written in C programming language, with real-time testing and debugging modules is full-featured and flexible for design user to program additional features. With the simple and clearly defined SDK it is easy to use and create proprietary functions. A sample code is enclosed to help understand the complex functionality of MicroPulse725: the sample shows controlling the synchronization of two lasers and high-speed digital camera for a high-speed pulsed laser illumination image acquisition.

Main features:

- Programmable synchronous master timing control unit
- Integrated scientific grade time signal generator
- 7 channels with high-precision independent delay time controller
- Simple control with software via USB
- Professional hardware timing logic control circuit
- 1ns TTL circuit set step 0.25 ns delay accuracy (* 0.1 ns for MicroPulse725-100 model)
- Upgradable hardware and software design
- No need for external power supply

Applications:

- Experimental mechanical testing
- MEMS / BioMEMS
- Analysis of materials science
- Mechanical synchronization
- Digital image control
- Life sciences
- Production line testing
- Aerospace equipment



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