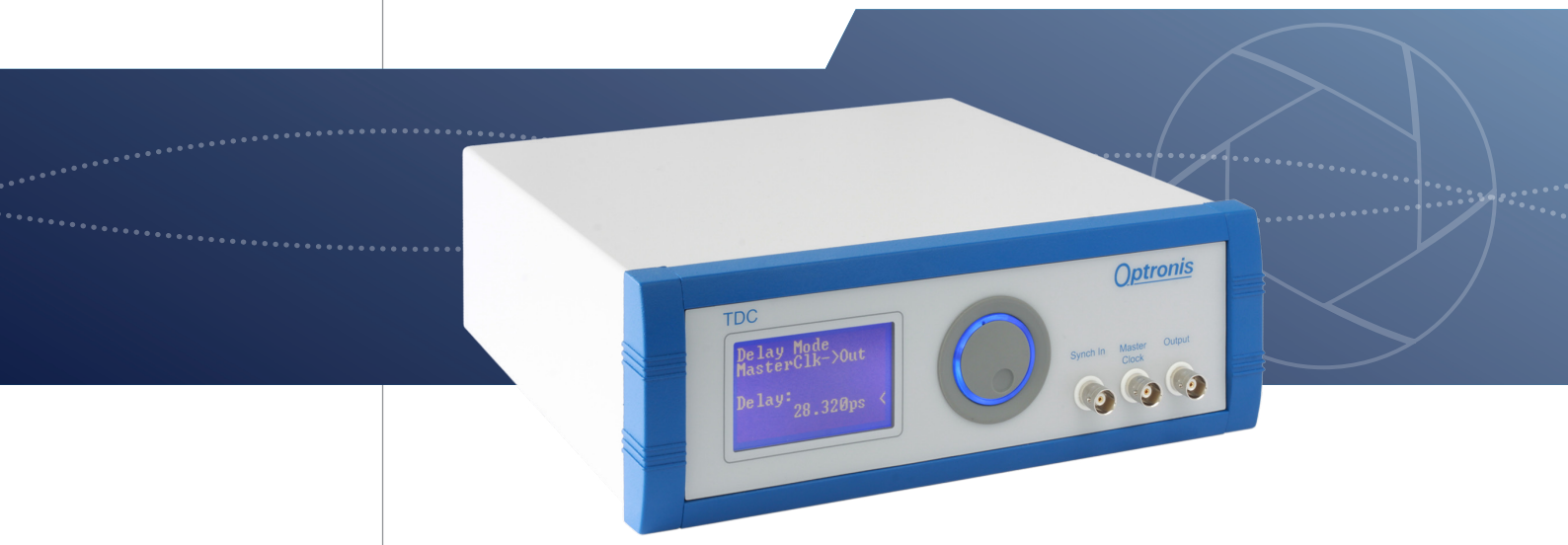
Optronis

Make time visible

STREAK CAMERA ACCESSORIES

TDC

Timing and Delay Controller



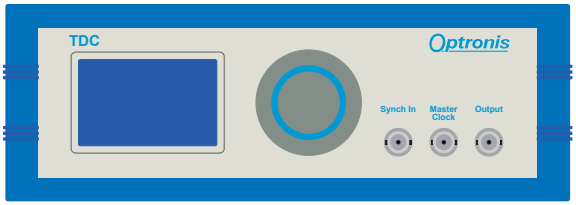
- Low jitter 5 ps
- Timing resolution 10 ps
- Synchronisation to 125 MHz master clock
- Local and remote control via USB
- Designed for laser systems using amplifier or pulse-picker

www.optronis.com

Timing and Delay Controller TDC

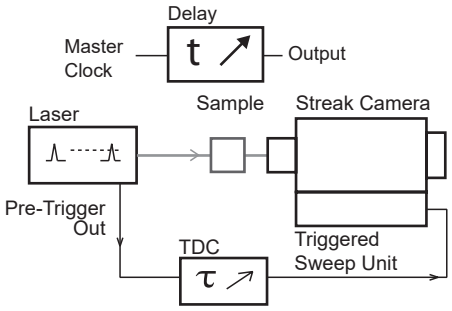
Optronis
Make time visible

The TDC is a timing and delay controller to generate trigger signals for streak camera systems typically when operated with lasers using amplifiers or pulse-pickers. Triggering sweep units like TSU12-.. or TSU11-.. is significantly simplified. Key features are ultra low trigger jitter and high delay time resolution. Details are available on Optronis' applications notes related to trigger setup configurations. Two operation modes of the TDC can be selected.



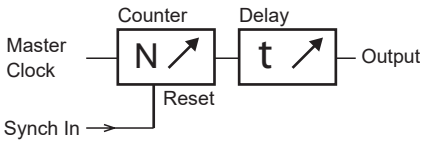
DELAY MODE

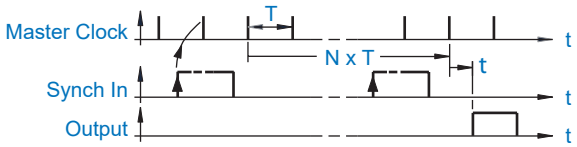
In delay mode the TDC provides an output signal with variable temporal delay τ related to the Master Clock input signal. Delay mode is typically used with low and medium repetition frequency (<4 MHz) laser systems.



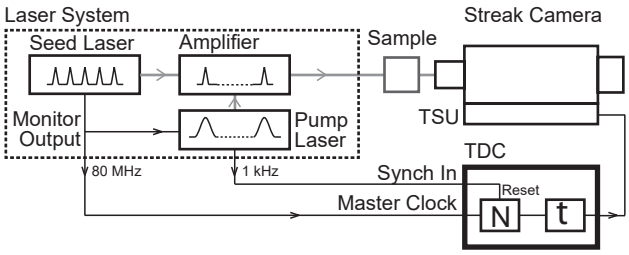
COUNTING MODE

In counting mode a Master Clock Signal is used to trigger a counter. The Synch In pulse resets this counter. The output signal appears after a variable number N of Master Clock pulses followed by a variable delay τ. This operation mode can be used with laser systems where a high repetition rate seed laser is used. Seed laser pulses are amplified or selected by a pulse-picker at lower rate. Master Clock frequency and Synch In freqeuncy have to have a constant ration.





Below a simplified schematics of an amplified laser system is shown with typical frequencies of 80 MHz and 1 kHz.



SPECIFICATIONS

Variable delay		T_{min} - 50 ns, 10 ps adjustment resolution
Minimum delay time T_{min}		<15 ns (Master Clock -> Output)
Counter N		1 .. 10^9, N < 1.5 × C/S
Jitter	Master Clock to Output	<5 ps rms, typ. 5 ps FWHM @ delay = T_{min} <10 ps rms @ delay = 50 ns
Master Clock Signal Input	Frequency (C)	1 - 125 MHz @ Counting Mode / 0 .. 4 MHz @ Delay Mode
	Amplitude	-3 dBm .. +3 dBm (0.45 Vpp .. 0.90 Vpp), sinusoidal @ Counting Mode +2 V .. +5 V, rising edge @ Delay Mode
Synch Signal Input	Frequency (S)	0 .. 4 MHz, C/S ration should be constant
	Amplitude	+2 V .. +5 V, rising edge @ Counting Mode
Output Signal	Frequency	0 .. 4 MHz
	Amplitude	>3 V, 50 Ω
	Pulse Duration	40 ns (typ.)
Interface		USB, type B connector
Dimensions	(W × H × D)	250 mm × 100 mm × 260 mm
Power Supply		100 V .. 240 Vac, 47 Hz .. 64 Hz
Environment		+0 °C .. +35°C / 20 .. 80% rel. huminidty non condensing

CONTACT INFORMATION

Optronis GmbH
Ludwigstraße 2
77694 Kehl
Germany

Phone: +49 7851 91 26 - 0
Fax: +49 7851 91 26 - 10
info@optronis.com
www.optronis.com

The information given herein is believed to be reliable, however Optronis makes no warranties as to its accuracy or completeness. Data sheet is subject to modifications at any time. 10/2026