Optronis

Make time visible

OPTOSCOPE-SC

Streak Camera Family

Streak Cameras with modular design for analysis of ultrafast optical signals

- **up to 35mm Photocathode**
- **down to 2 ps Temporal Resolution**
- **Triggered and Synchroscan Operation**
- **Various Photocathode Types**
- **Modular and flexible design**
- **Ethernet interface**

SC-Family

The Optoscope-SC streak camera family is designed to provide maximum flexibility for a broad range of applications. Identical control structures and similar mechanical interfaces are used in all units. This concept allows integration of different streak tubes optimised for dedicated applications. Various sweep units for trigger mode and synchroscan deflection are available. The modular design allows to adapt the system easily. An Ethernet (TCP/IP) interface is integrated to control the system.

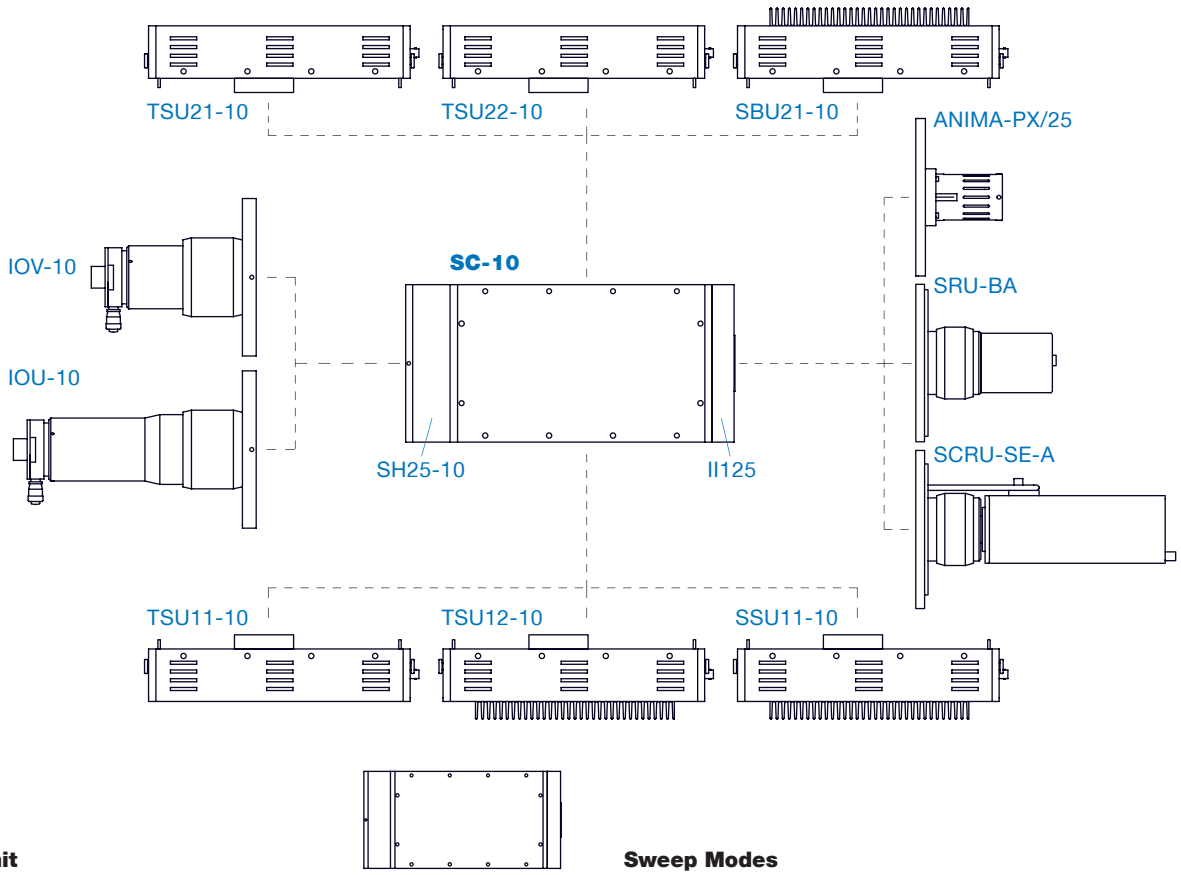
Each Optoscope-SC streak camera system consists of a main unit (SC-10, SC-20, SC-51, ...) completed with one or more sweep units, input optics and readout camera with control software. An image intensifier can be added for highest sensitivity. For simple system control a control pad as well as the OptoAnalyse software is provided. Accessories like spectrometers, trigger signal converters and trigger signal conditioning units are available to adapt the system to particular requirements.

General Features
› Modular and flexible design
› Exchangeable sweep units
› Local control via control pad
› Easy to use software OptoAnalyse
› 100 Mb Ethernet interface
› Standard TCP/IP protocoll

SC-10 System

The SC-10 is designed for most flexibility and highest temporal resolution. It allows to use input optics for visible light and UV light down to 200 nm. Sweep units for trigger mode or synchroscan mode operation are available.

› Broad range of scientific applications
› Main unit prepared for dual sweep
› Temporal resolution down to 2 ps
› High dynamic range



Main Unit

Photocathode types	S20, S20LN, S25, Bialkali
Photocathode active area	8 mm x 2 mm
Temporal resolution	2 ps (at fastest speeds)
Deflection plates	2 perpendicular pairs
Magnificatin	2 (typ.)

Sweep Modes

Triggered sweep (TSU1x-10)	0 up to 4 MHz
Triggered sweep time base	200 ps to 100 ms
Synchroscan sweep (SSU11-10)	40 MHz to 250 MHz
Synchroscan sweep time base	300 ps to 4 ns
Orthogonal sweep	TSU2x-10 or SBU21-10

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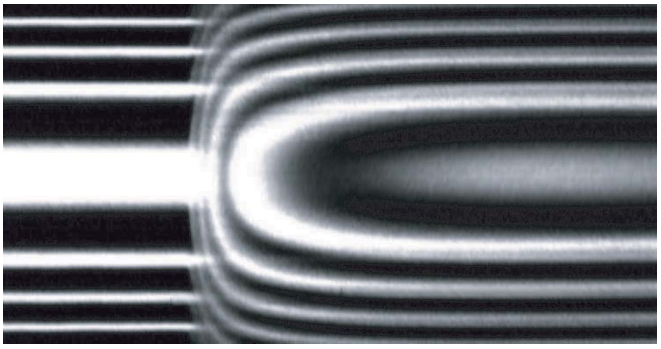
SC-20 and SC-51 Systems

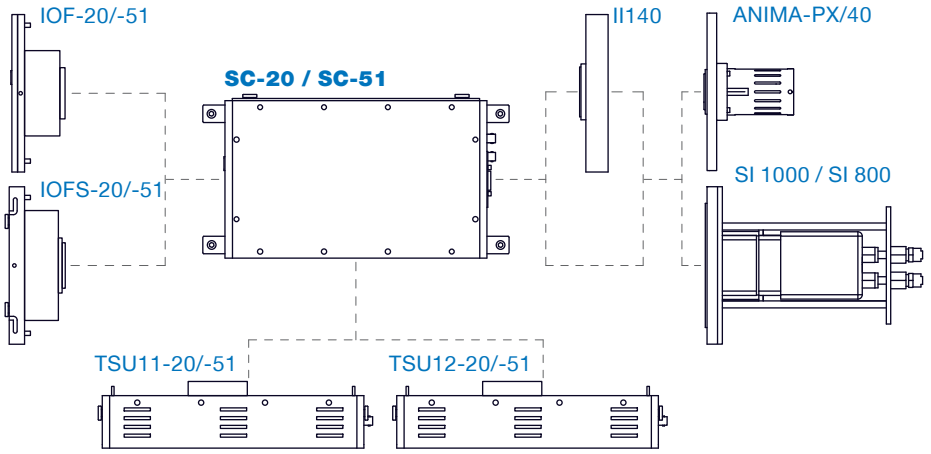
The SC-20 and SC-51 are large format photocathode streak cameras for detonics and laser Doppler interferometry. The fiber optic input allows direct coupling with fixed slits.

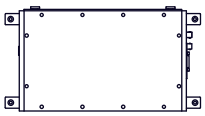
› Photocathode length 35 mm
› Different photocathodes
› Fiber optics input window
› UV Sensitivity (SC-20)
› Photocathode gating

Applications
› Laser Doppler Interferometrie
› Detonics and balistics



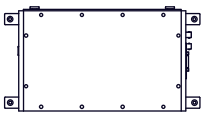
Typical measurement in a Laser Doppler Interferometrie setup





SC-20 Main Unit

Photocathode types	S20, S25, Bialkali, S20UV
Temporal resolution	typ. 200 ps (streak tube)
Photocathode active area	35 mm x 4 mm
Phosphor screen active area	28 mm (temp.) x 28 mm (spat.)
Magnification	0.8 typ.



SC-51 Main Unit

Photocathode types	S20, S25, S1
Temporal resolution	typ. 200 ps (streak tube)
Photocathode active area	35 mm x 4 mm
Phosphor screen active area	28 mm (temp.) x 26 mm (spat.)
Magnification	0.75 typ.

SC-21 and SC-52 Systems

Applications requiring higher temporal resolution combined with medium to large size photocathodes are covered by SC-21 and SC-52 based streak system.

› Photocathode length 15 mm (16mm with SC-21)
› Temporal streak tube resolution 5 ps
› Different photocathodes
› UV Sensitivity (optional)

Applications
› Fundamental research
› Laser Doppler Interferometrie
› Detonics and balistics

SC-82 Systems

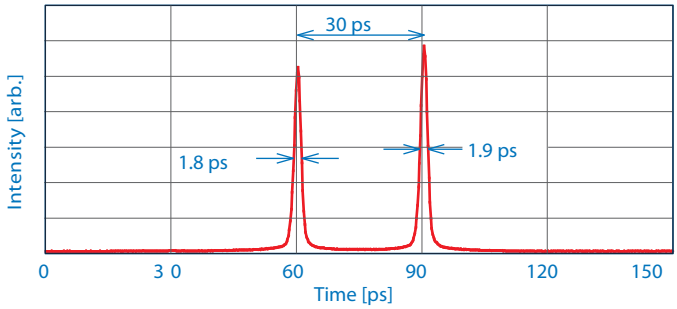
A Bilamenary streak tube is integrated to provide high dynamic range performance and picosecond temporal resolution. The SC-82 based system can be used for high power laser diagnostics.

› Temporal streak tube resolution 1 ps
› Photocathode length 15 mm
› Different photocathodes
› UV Sensitivity down to 200nm available
› High dynamics

Applications
› Laser diagnostics of high power lasers

Temporal Resolution

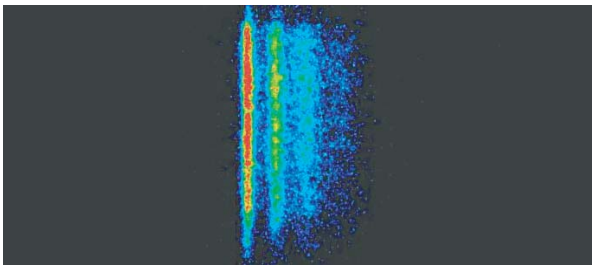
Streak cameras provide very high temporal resolution. At fastest sweep speed 2ps can be obtained either in synchroscan sweep mode or in triggered mode with single-shot operation. The example below shows a partial trace recorded with a SC-10 system in synchroscan mode at 15ps/mm sweep speed.

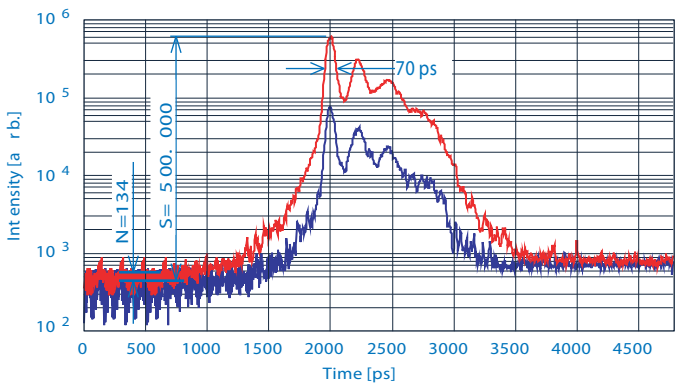


Temporal resolution of streak cameras characterize the temporal instrument response function. Optronis provides temporal resolution information for the complete system including all elements and without de-convolution.

Dynamic

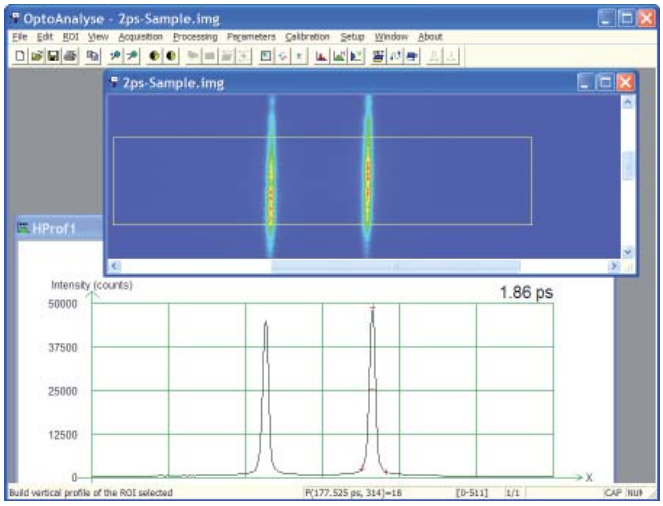
Streak camera dynamic is defined as ratio between peak intensity and rms noise level while the system is operated in its linear regime. The single-shot trace of a laser diode shows a dynamic range of 3700 when measured with a SC-10 based system. Accumulation of individual traces either on the phoshor screen or by adding images (OptoAnalyse) extends the signal to noise ration of the measurement.





OptoAnalyse Software

The OptoAnalyse software provides an easy to use software interface to operate the OPTOSCOPE-SC streak camera system. It allows to control all streak camera functions and to analyse streak camera images. The OptoAnalyse software is optimized for effective image acquisition and analysis. It provides various tools for temporal or spatial analysis. With the photon counting feature combined with drift and jitter correction, long term measurements with high sensitivity and high temporal resolution are possible.

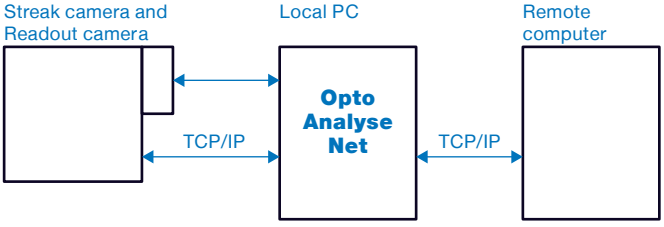


Key features

› Image acquisition in analogue or photon counting mode
› Image procesing with fixed point 32 bit intensity coding
› Acquisition in continuous or single-shot operation
› Automatic capture of measurements using sequences acquisition
› Real-time video display with profile information
› FWHM display and Gauss-fitting in real time
› Spectrometer control and wavelngh calibration (Version 3.2)
› Post-processing (digital filter, histogram, profiles, mean value)
› For use with all available readout cameras
› Drift and jitter correction
› Single and multi streak camera control

OptoAnalyseNet Software

The OptoAnalyseNet program is an extended version of the OptoAnalyse software. The extension allows to remotely access to all high level software functions. This simplifies the integration of the streak camera system into a control system environment



Key features

› Local operation identical to OptoAnalyse software
› Remote access to image data and measurement data

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