ROSS 1000 Streak Camera System

The ROSS 1000 Streak Camera System is engineered for facilities performing diverse experiments with a range of temporal requirements. The unit is small, portable, and provides users with maximum flexibility. Each timing module provides up to 16 sweep windows and, if needed, timing modules can be swapped quickly and easily for even more timing flexibility. Through Sydor's powerful ROSSApp software, the system's internal triggers can be synchronized automatically with a single experiment master trigger, making synchronization intuitive and user-friendly.

The sweep modules of every ROSS 1000 system are customized in collaboration with the customer. This ensures that both the best temporal resolution and total data acquisition duration can be optimized to each customer's needs. Sydor's engineers are knowledgeable in the applications utilizing streak cameras. Their experience allows each unit to be built to individual requirements.

The ROSS 1000 system offers further flexibility in its capability to work in single shot mode, slow rep readout mode, or fast repeated sweep mode. In fast repeated sweep mode the swept signal can be accumulated multiple times over a single CCD exposure. This is ideal when weak signals need to be accumulated to increase precision such as in FLIM or in optical temperature measurement applications. The swept signal can be driven at rates of up to 2 MHz (depending on sweep window duration).

Sydor also offers a cost-effective alternative to traditional imaging optics. With all-reflective Offner input optics, users minimize chromatic aberrations and observe superior performance compared to traditional inputs.

For spectroscopy applications, Sydor can supply a spectrometer (or use a customer-supplied spectrometer) and mate it to the streak camera through the use of a light-tight Spectrometer Interface Module. This module allows for fine positioning control and securely couples the two instruments in a manner that protects the photocathode, while maintaining the fidelity and alignment of the input signal.

Each ROSS System is supplied with ROSSApp software, which runs the streak camera and, when used, the spectrometer. This powerful tool collects data, performs image analysis, and is capable of scripting for easy automation of repetitive tasks, such as calibration or exporting of image data.
Product Specifications

Sydor Technologies

- Trusted and proven supplier to major labs worldwide running critical experiments
- Inclusive support from our PhD support staff via telephone and email for the life of the system
- Factory calibration and QA of all systems for ultimate confidence in performance.
  Recommended operating parameters provided with every system

Timing

- Swappable timing boards: Users can easily and quickly swap timing boards to meet variable experimental configuration requirements
- Time resolution: <2 ps
- Sweep Window Rep rate: Up to 2 MHz for 2 ns window or ~2.5 KHz for 200 ps window
- Sweep window timing configuration: Every Sweep window duration is custom, for the best temporal resolution and total data acquisition duration optimized to a customer’s experimental timing needs
- Sweep window ranges: See separate sweep window configuration diagram for options
- Trigger jitter: 10 ps
- MCP gating: Extinction Ratio >10^6, 3 ns FWHM @ 200 kHz max
- Number of sweep speeds per timing board: 16
- Trigger signals: 5 V TTL (50 Ohm)
- Master trigger options: The user may supply a single trigger, which is then used to trigger all the other components of the system, such as sweeps, gating, shutter, and CCD, with the appropriate timing

Streak Tube Features

- Photocathode materials: S20B, Low Noise S20, S20 (others possible dependant on spectral response requirements)
- Input windows: Fused Silica, Sapphire, plus others on request
- Accelerating electrode configuration: Mesh - Allows 2D imaging
- Tube magnification: 2:1 typical
- MCP: Single stage MCP with adjustable gain
- Shielding: Mu metal sheilding (prevents EMC interference)
- Static spatial resolution: >10 Lp/mm with contrast exceeding 40%

Input Options & Optics

- Offner input optics: Included as standard - works for all wavelengths from UV to Near IR and removes any chromatic aberrations
- Spectrometer options: Coupling to most spectrometers possible with various options for focal lengths and multiple grating turrets with flip in mirrors
- Spectrometer coupling mechanics: Optional spectrometer interface modules allow precise adjustment slit and spectrometer alignment
- VISAR Optics: VISAR Optics available on request
- Calibration inputs: Bench top calibration equipment such as fiberised laser pulsers, MHz optical comb generators and resolution reticles available on request
- Slit adjustment: Micrometer for adjustment of slit opening between 50 µm and 1 mm

Specifications subject to change
Product Specifications

Readout Cameras

- **Camera resolutions**: 2452x2056
- **Temporal Dark Noise**: 13.5 e-
- **Max resolution rep rates**: 9.2 frames/s @ full resolution (faster rates available when binning)
- **Pixel Size**: 3.45 µm x 3.45 µm

PC & Software

- **Software**: ROSSApp software lifetime licence included with system. Controls complete camera system either locally or remotely for acquisition and image processing
- **Calibration features**: Calibration routines for spatial AND temporal non-linearity corrections. Factory generated calibration files included at shipment, plus re-calibration options accessible in software
- **Interface**: Ethernet
- **Power**: Standard mains supply (120/240V)
- **Operating system**: Windows

ROSS 1000 Coupled to Spectrometer

Outline Dimensions

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