Features

- 400 – 900 nm spectral sensitivity
- 5 ps impulse response
- 10 ps trigger jitter
- Trigger external or command
- 5 to 50 ns analysis duration
- 1024 x 1024, 12-bit readout camera
- Controlled via Ethernet, Internet (Web page)
- Options: high resolution read out cooling camera

Applications

- Research involving pulsed laser
- High speed optical communication
- Picosecond Time interval Meter
- Measurement of electron bunch for Synchrotron
- Biology and Photochemistry

Description

The CBF500 is well suited for single shot analysis of ultra-fast optical phenomena with high dynamic. All settings and data transfer can be remote controlled via Ethernet (10/100Mb/s) or Internet (Web page from Internal Web server). The architecture of CBF500 is modular allowing to change module to meet your specific needs and requirements. A power full control panel Web page provides a simple method to configure the settings, to control the state of the instrument, and to display or store acquired data.

CBF500 is a licensed product under CEA contract.

Application Example: Checking of 6 GHz, 900 nm wavelength "Comb Generator" connected to Marker Input. The following burst is recorded at 5ns sweep duration.
# Specifications

## INPUT OPTICS MODULE

**Optical Signal Input**
- Spectral transmission (UV) 400 nm - 900 nm
- Image magnification ratio 1 : 1
- Input Slit 200 µm Width / 25 mm Length

**Fiber Input for Marker**
- Peak power 3 mW
- Wavelength 680 nm
- Connector SMA 905

## BASE MODULE (Electronics + Streak Tube)

**External Trigger**
- Trigger level 0.5 V to 4 V
- Sensitivity 5 V / 50 Ω
- Jitter RMS 10 ps
- Delay 100 ns
- Maximum rate 1 Hz

**Soft Trigger**
- Trigger Source Ethernet/ Internet command

**Trigger output**
- Function Mark beginning of sweep
- Level / rise time 5 V / 5ns under 50 Ω
- Shape Rectangular, 1 µs width

**RDY Output**
- Function Mark when the Readout Camera is ready
- Level 5 V under 50 Ω

**Digitizing**
- Sweep duration 5, 10, 20 and 50 ns
- Impulse response 5 ps
- Dynamic 150
- Spatial magnification 1.3
- Acquisition mode Single shot, repetitive, static
- Data format Raw (image)

**System control**
- Setting and Data Via Ethernet and Internet (Web pages)

**Utility**
- Power supply 24 V DC, 100 W
- Operating temperature +20 to 30°C
- Dimension 400 mm (H), 370 mm (W), 605 mm (D)
- Weight 21 kg

## STANDARD READ OUT CAMERA MODULE

- Resolution 1024 X 1024 pixels, 12-bit A/D
- Pixel size 24 µm
- Read noise 20e- RMS
- Temperature cooling 15°C
- Interface Via the base module

## OPTION 1: AC/DC POWER CONVERTER

- Input voltage 90 V to 240 V / 50 – 60 Hz
- Output Power 24 V DC, 5 A
- Dimensions 77 mm (H), 170 mm (W), 321 mm (D)
- Weight 2 kg

## OPTION 2: HIGH RESOLUTION READ OUT CAMERA MODULE

- Resolution 1392 X 1040 pixels, 16-bit A/D
- Read noise 3e- RMS
- Temperature cooling Ambient to -50°C
- Interface USB to PC
Operating Information

Block diagram of the Streak Camera

**Input optics:**
In this module the light is projected into a slit and focused on the photocathode of the streak tube. Marker Input is a specific channel to stamp the optical signal. In standard the Slit width is 200 µm. Other width are available (ask to the factory).

**Streak tube**
Streak tube is heart of the instrument. Photocathode converts the photon in a number of electrons proportional to the intensity of the light. These electrons are accelerated, swept and after which they are bombarded the phosphor screen to create an image. Photocathode is with multialkali on sapphire window (S20 type).

**Sweep generator**
The sweep generator can be triggered from an external signal or Ethernet/ internet command. The sweep speed is adjustable from 5 ns, 10 ns, 20 ns and 50 ns. To optimize performance each sweep as a specific settings saved in the instrument.

**High Voltage Power Supply**
Three High Voltage programmable Power Supplies are connected to Cathode, Grid and Focus electrodes of the Streak tube. From a Voltage fault a high performance safety system stop the three High Voltage Power Supplies to avoid any damage on Streak tube.

**Readout Camera**
A digitizing system is coupling to the screen tube via fiber optics to readout the image. This system enable precise digital acquisition stored in image memory (Raw data). The Raw data can be processed and transferred via Ethernet to provide a two dimensional waveform data. In option a high resolution read out camera can be connected.

**Interface Controller**
It manages internal functions and user interfaces. All the parameters and data can be remote controlled via Ethernet (10/100 Mb/s) or Internet (Web page from internal Web server) All parameters values are automatically saved.
Control and Software Tools

They are two ways to control the Streak Camera:

- "Quick remote mode" via Internet and web pages. Web page from embedded server, provides a simple method to configure setting, to control operation, to display status of the instrument and to display the raw data stored in readout camera. Data can be saved via Ethernet in "RAW" data file format for off-line analysis or in "JPEG" file format to be displayed.

  The web page can be opened via internet explorer, Mozilla Firefox or Chrome. After connecting a cable from the CBF500's Ethernet port to your computer network, enter the CBF500's IP address into your PC's browser (the IP address can be identified or assigned via the web page). The browser will automatically open the control panel web page on your PC.

- “General remote mode” via Ethernet and LabVIEW software application or other PC software application. (Example of use is provided in a user’s manual)
CBF500
High resolution Streak Camera

Inputs outputs Interfaces

**Enclosure** (dimension are in mm)

Right Panel Input and output

Right Panel Connectors, Switch and Indicators

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<thead>
<tr>
<th>Indicators</th>
<th>Readout Camera connectors</th>
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<tbody>
<tr>
<td>PWR Power On</td>
<td>TRIG Trigger Input: BNC connectors</td>
</tr>
<tr>
<td>ARM Trigger Armed</td>
<td>RDY End of cycle: BNC connector</td>
</tr>
<tr>
<td>FAULT Error</td>
<td>Interface Connectors and Switch</td>
</tr>
<tr>
<td>Trigger connectors</td>
<td>DC IN +24 V Power input: UTO Souriau connector</td>
</tr>
<tr>
<td>TRIG IN Trigger Input: BNC connector</td>
<td>CAL N.C</td>
</tr>
<tr>
<td>SYNC Trigger Output: BNC connector</td>
<td>LAN Ethernet connection: RJ45 connector</td>
</tr>
<tr>
<td></td>
<td>ON/OFF Power Switch On/off</td>
</tr>
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</table>

Ordering Information

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBF500</td>
<td>Base version with standard readout module</td>
</tr>
<tr>
<td>CBF500-1</td>
<td>Adds option 1: AC/DC power converter</td>
</tr>
<tr>
<td>CBF500-2</td>
<td>Adds option 2: High resolution readout module</td>
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