

## NEW CinCam CMOS - Product Description -

A particular cost-effective entry-level beam profiler is available now. This high-speed USB 2.0 compatible beam profiler based on a megapixel CMOS sensor provides accurate laser beam analysis.

Thanks to its high resolution and its small pixel size, the beam profiler is a high performance tool for laser beam analysis of continuous wave (cw) and pulsed laser modes. The compact design permits easy integration in optical assemblies.

The portable CinCam is designed to be used in a variety of applications in industry, science, research and development, including:

- Laser beam analysis of cw and pulsed lasers,
- Quick control of laser modes and adjustment errors,
- Test equipment for scientific research,
- Near-Field and Far-Field analyses of lasers, LED devices and other light sources,
- Integration in optical systems.

The CinCam CMOS includes the specifically designed analysis software, RayCi. It is available in two versions: RayCi-Lite for basic beam analyses and RayCi-Standard with an extensive range of laser beam analysis techniques.

RayCi's sophisticated software architecture opens up new opportunities in laser beam analysis according to ISO standards. Beam quality, beam parameters and beam stability are just a few of the many possible opportunities determinable by RayCi. Incomparable visualization modes simplify the laser beam analysis.

### ACCESSORIES

#### Converter Types

CINOGY is able to customize a variety of converter types to fulfil almost any beam profiling requirement.

- UV-Converter / Phosphor Coating: 100nm-320nm
- IR-Converter / Phosphor Coating: 1495nm-1595nm

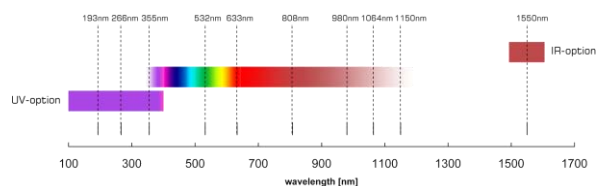
#### Neutral Density Filter

To expand the power range of the CinCam several absorptive and metallic-coated neutral density filters are available, which are specified by optical densities ranging from OD 1.0 to OD 4.0.

#### Optical Components

The concept of the CinCam enables easy adaption to standard optical imaging systems, attenuators and opto-mechanical components ensuring highest flexibility.

### LASER



- UV-range: Excimer-Laser
- VIS-range: HeNe-Laser, Diode-Laser
- NIR-range: Nd:YAG-Laser, Fiber-Laser
- Extended NIR-range: Diode-Laser, Fiber Laser



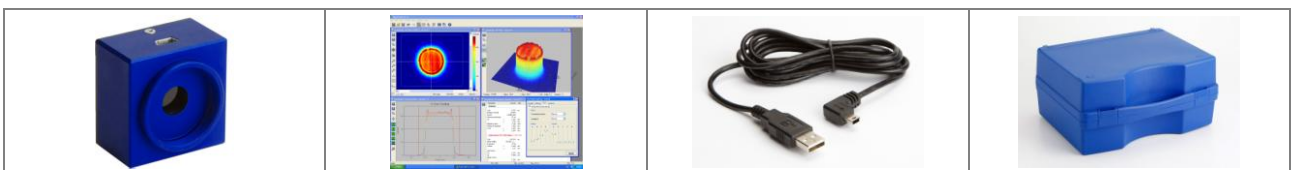


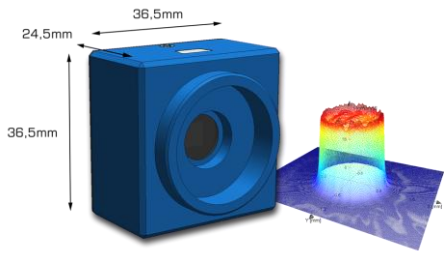
**NEW**  
**CinCam CMOS**  
**- Technical Data -**

	CMOS-1201	CMOS-1202
<b>SENSOR DATA</b>		
Format:	1/2"	1/1.8"
Active area:	6.7mm x 5.3mm	6.8mm x 5.4mm
Number of pixel:	1288 x 1032 (1.3MPixel)	1280 x 1024 (1.3MPixel)
Pixel size:	5.2µm x 5.2µm	5.3µm x 5.3µm
Spectral response without cover glass:	350nm - 1100nm	350nm - 1100nm
Laser beam diameter min / max:	52µm / 4mm	53µm / 4.1mm
<b>CAMERA FEATURES</b>		
Mount:	Filter-Mount	Filter-Mount
Bit depth (output):	8Bit (10Bit)	8Bit (10Bit)
Dynamic:	>61dB (1:1120)	>62dB (1:1250)
Frame rate:	up to 25Hz	up to 25Hz
Exposure time:	100µs-1s	50µs-1s
Interface:	USB 2.0 (Mini USB-B connector)	USB 2.0 (Mini USB-B connector)
Shutter:	Rolling	Global
Mode:	cw	cw or pulsed
Trigger:	-	TTL-signal
Combinable with:	IR- / UV-Converter Beam expander Attenuator	IR- / UV-Converter Beam expander Attenuator
<b>SPECIFICATIONS</b>		
Mechanical dimensions (W x H x L):	36.5mm x 36.5mm x 24.8mm	40mm x 40mm x 24.8mm
Weight:	46g	50g
Electrical requirements:	Power supply via USB	Power supply via USB
Storage temperature*:	-10°C...+60°C	-10°C...+60°C
Operating temperature*:	+0°C...+40°C	+0°C...+40°C
Regulations:	CE, RoHS	CE, RoHS

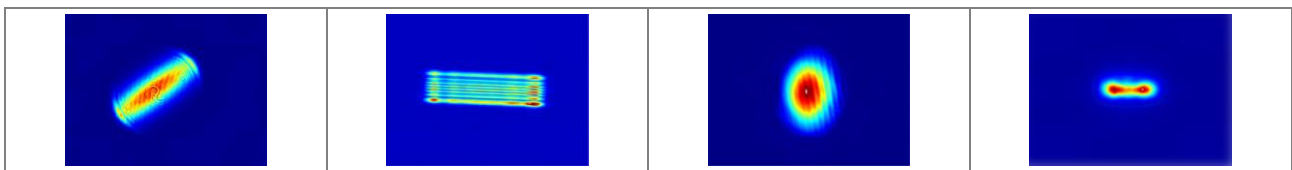
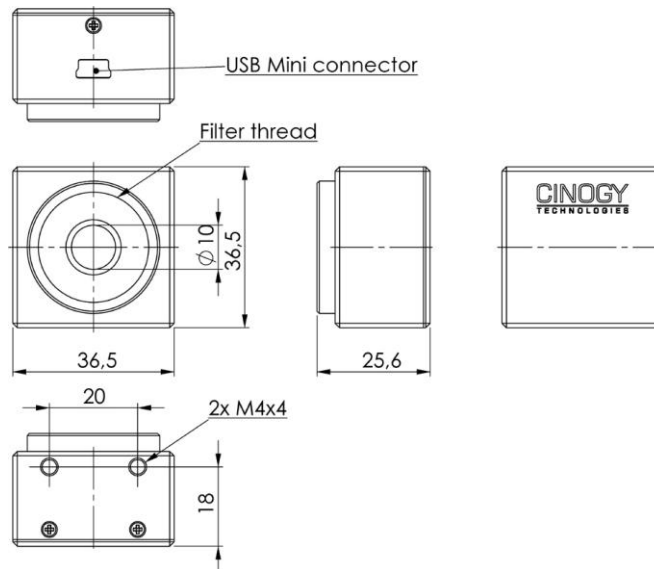
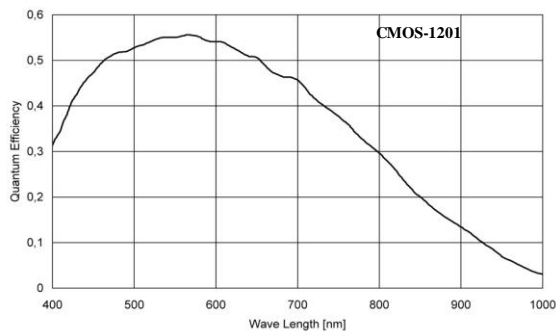
\* without condensation

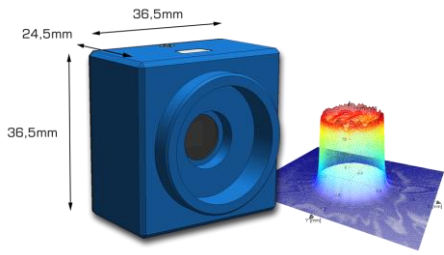
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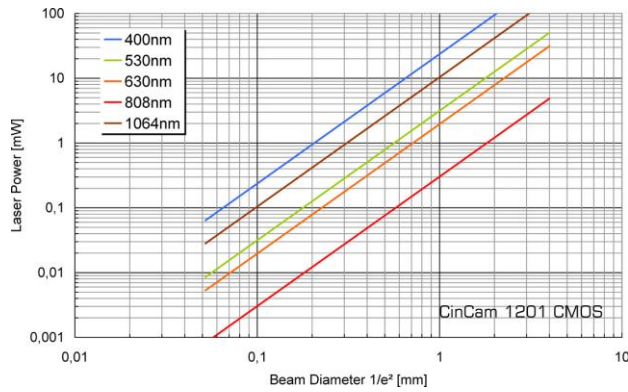
**NEW**  
**CinCam CMOS**  
 - Sensor Response -  
 - Dimensions -



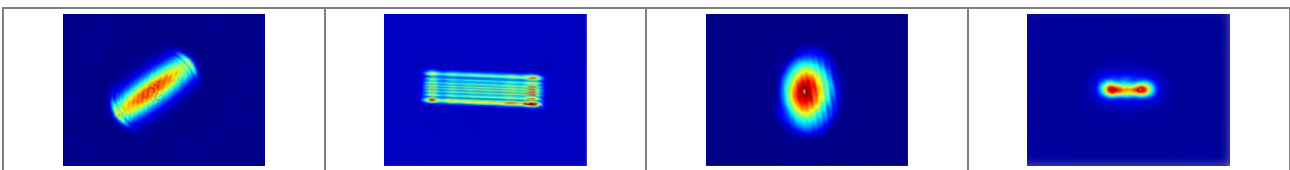
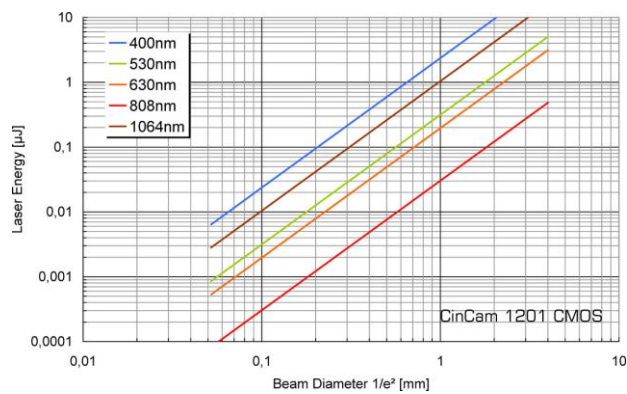


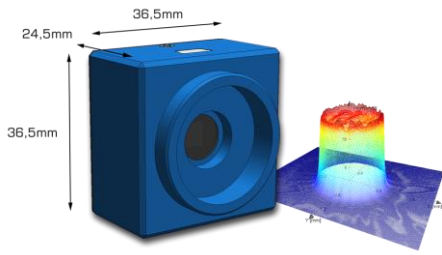
**NEW**  
**CinCam CMOS**  
**- Operational Range -**

Maximum CW power for saturation limit



Maximum PULSE energy for saturation limit  
 (single pulse during the exposure time)





**NEW**  
**CinCam CMOS**  
**- Operational Range -**

**Saturation limit assumes:**

Saturation level:	90%
Built-in ND-Filter:	OD3.0
Exposure time:	100µs (lowest value)
Gain:	1 (lowest value)
Maximum beam power:	<1W

**A higher power level is possible with additional ND filter:**

Optical density	Higher limit
OD 1.0	10 x Saturation limit
OD 2.0	100 x Saturation limit
OD 3.0	1000 x Saturation limit
OD 4.0	10000 x Saturation limit

**By longer exposure times a lower power level is apply:**

Exposure time	Lower limit
100µs	See chart for cw saturation limit
1ms	0.1 x Saturation limit
10ms	0.01 x Saturation limit
100ms	0.001 x Saturation limit
1000ms	0.0001 x Saturation limit

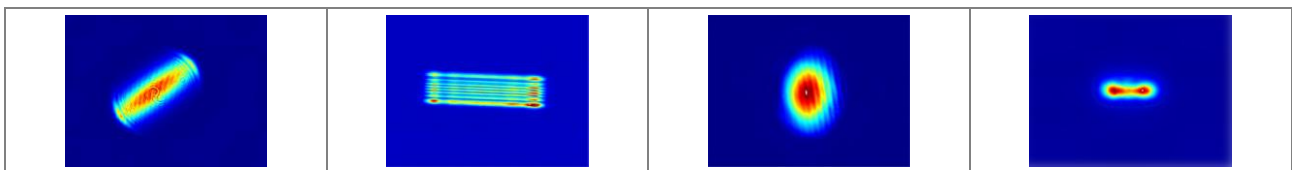
**Only for cw laser!**

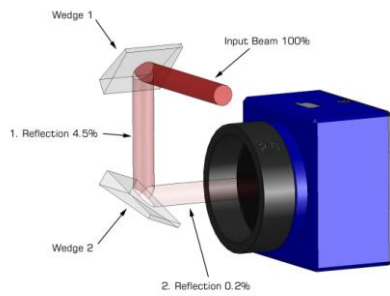
**Max. pulse repetition rate / pulse length for single pulse measurement:**

See chart for pulse saturation limit

Exposure time	Pulse repetition rate / pulse length
100µs	10kHz / <100µs
1ms	1kHz / <1ms
10ms	100Hz / <10ms
100ms	10Hz / <100ms
1000ms	1Hz / <1000ms

**Only for pulsed laser!**





**NEW**  
**Prism Attenuator**  
**- Technical Data -**

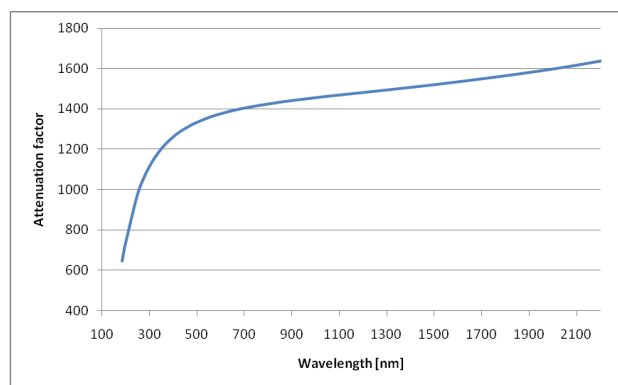
The modular prism attenuator is an add-on to a standard CinCam Beam Profiler. It is based on two uncoated fused silica wedges and is designed for a pre-attenuation for high intensive laser beams. The technical principle is based on the polarization effect by reflection on an optical surface. The s-pol. and p-pol. parts of the laser beam have different reflection factors. Cause of the orthogonally arrangement of the wedges, the polarization effect is compensated and the laser beam is neutrally attenuated.

The prism attenuator can be combined with a neutral density filter for a final power adjustment to the beam profiler sensitivity level. The high performance optical design in compact housing allows precise beam attenuation.

**PA-12-2x**

Free aperture:	15 x 15 mm <sup>2</sup>
Wedge material:	Uncoated fused silica
Spectral range:	190nm - 2.000nm
Maximum input power:	<100W
Maximum cw power density:	<10kW/cm <sup>2</sup>
Maximum pulse power density:	2GW/cm <sup>2</sup> 30J/cm <sup>2</sup> @ 15ns, 1Hz

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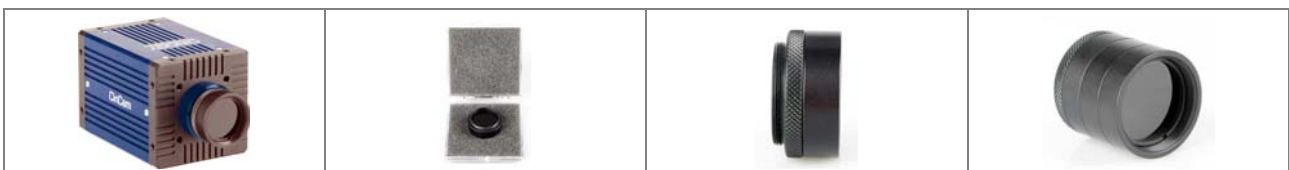
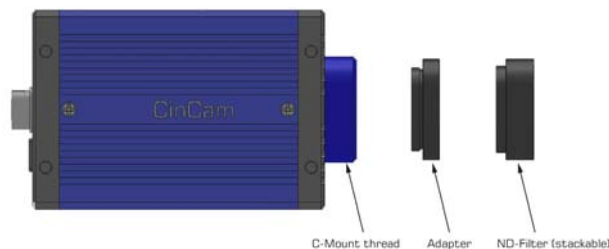
## Neutral Density Filter - Technical Data -

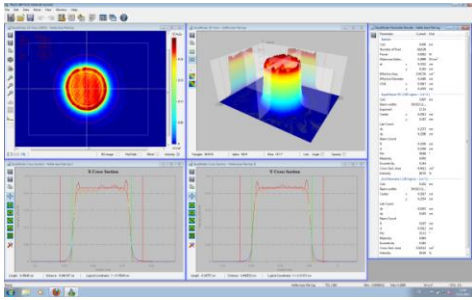
CINOGY's neutral density filters allow broadband attenuation for a spectral range from VIS to NIR. Due to their excellent surface quality the absorptive and reflective filters enable precise beam attenuation for low power applications. The level of attenuation is specified by the optical density. Filters with different optical densities can be combined. A filter adapter is available to mount the filters on the CinCam aperture.

	<b>Reflective ND filter</b>	<b>Absorptive ND filter</b>
	<b>NDR-10 / NDR-20 / NDR-30 / NDR-40</b>	<b>NDA-10 / NDA-20 / NDA-30 / NDA-40</b>
Optical density*:	1.0 / 2.0 / 3.0 / 4.0	1.0 / 2.0 / 3.0 / 4.0
Spectral range:	200nm - 2100nm	400nm - 700nm / 700nm - 1200nm
Material:	UV-Fused silica (Coating: Metal)	Schott glass
Flatness:	1λ @ 300nm	λ/10 @ 632.8nm
Scratch-Dig:	40 - 20	40 - 20
Parallelism:	3arcmin	10arcsec
Optical density tolerance:	±5%	±5%
Power (P <sub>max</sub> ):	< 1W	< 1W
Intensity (I <sub>max</sub> ):	0.75W/cm <sup>2</sup>	1W/cm <sup>2</sup>
Diameter:	Ø=25mm/25.4mm	Ø=25mm/25.4mm
Operating temperature:	< 100°C	< 100°C
Filter threads:	Filter thread / Filter mount	Filter thread / Filter mount
Filter adapter:	C-Mount thread / Filter thread	C-Mount thread / Filter thread

\* other optical densities on request

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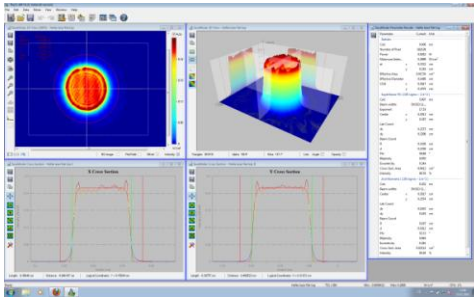


## RayCi - Short Version Overview -

	Lite	Standard	Professional
<b>System</b>			
XP, Vista, Windows 7	32Bit / 64Bit	32Bit / 64Bit	32Bit / 64Bit
<b>Beam Profiler</b>			
Multi-Use (Several Beam Profilers simultaneously)	○	○	●
CW Mode / Pulse Mode (Software Trigger)	● / ●	● / ●	● / ●
Live Mode (live data) and Save Mode (stored data) can be used simultaneously	●	●	●
Automatic Update Support	○	●	●
Automatic Email Support	●	●	●
Upgrades Available for Purchase	●	●	●
<b>Visualization Windows</b>			
2D-View (2D Profile, AOI Features, Beam Width, Cuts)	●	●	●
3D-View (3D Profile, Coordinate System, Rotation, Cuts, Gauss Fit)	○	●	●
Histogram (Probability Density Distribution, Separators)	○	●	●
Cross-Section (X/Y-Cut, Radial-Cut, Circular-Cut, Arbitrary-Cut, Beam Width, Separators)	●	●	●
Number of Cross-Section Windows	1	2	2
Variants of Cuts	X, Y	All	All
Beam Results (Statistics, Beam Parameter)	●	●	●
<b>Measurement Windows (ISO 11146, ISO 13694, ISO 11670)</b>			
Single Measurement (2D / 3D-View, Histogram, Cross-Section, Beam Results)	●	●	●
Sequence Measurement (2D / 3D-View, Histogram, Cross-Section, Beam Results)	○	●	●
Beam Stability (Max Intensity, Power, Center X/Y, Beam Size: d, D, Phi)	○	●	●
Pointing Stability (XY Fluctuation, Center of Gravity Position Analysis, Power Spectrum)	○	●	●
Beam Quality M <sup>2</sup> Tool (2D / 3D-View, Caustic Fit, 3D Caustic Fit, Caustic Parameter)	○	○	●
<b>Standard Features</b>			
Option Window for Features Control	●	●	●
Look-Up Table (LUT), Automatic Contrast Function	●	●	●
Spatial / Power Units (px, μm, mm, cm, in, m / l, nW, μW, mW, W, kW)	●	●	●
Coordinate System (Standard, User-Defined)	●	●	●
Zoom Function (All Visualization and Measurement Windows)	●	●	●
Camera Settings (Wavelength, Gain, Exposure Time, Floating Average)	●	●	●
Trigger Settings (Polarity, Delay time, Auto Pulse Finder)	●	●	●
Measure Types (Max Speed, Max Calculation)	●	●	●
<b>Correction and Calibration Tool</b>			
Background Correction (incl. Cold and Hot Pixel)	●	●	●
Flatfield Correction	○	●	●
Pixel Correction Technology (Offset Correction, Linearity, ect. )	○	●	●
Intensity / Power Calibration	○	●	●
<b>Beam Width Techniques</b>			
Threshold	●	●	●
2 <sup>nd</sup> Moment	●	●	●
Gauss-Fit	○	●	●
Super-Gauss-Fit	○	●	●
Plateau	○	●	●
Geometry Simple	○	●	●
Geometry Area	○	○	●
Knife-Edge	○	●	●
Moving Slit	○	●	●
● included    ○ not included    (●) on request			







# RayCi

## - Short Version Overview -

	Lite	Standard	Professional
<b>Beam Parameters</b>			
Exponent	○	●	●
Center X, Center Y	●	●	●
Labor Coordinates (dx, dy)	●	●	●
Beam Coordinates (D, d)	●	●	●
Angle Phi	●	●	●
Ellipticity	●	●	●
Uniformity	●	●	●
Roughness	○	●	●
Slope	○	●	●
Excentricity	●	●	●
Cross-Sectional Area	●	●	●
Intensity	●	●	●
Effective Power	●	●	●
Power Ratio	●	●	●
Effective Area	●	●	●
Mean Intensity	●	●	●
Flatness	●	●	●
Edge Steepness	●	●	●
<b>Beam Statistics</b>			
Number of Pixel	●	●	●
Power	●	●	●
Maximum Intensity at x, y	●	●	●
Effective Area	●	●	●
Effective Diameter	●	●	●
Center of Gravity at x, y	●	●	●
<b>Work with Acquired Data / Stored Data</b>			
Arithmetic Operations (Add, Subtract, Multiply, Divide, Raise)	●	●	●
Image Transformation (Flip vertical / horizontal, Rotate Left / Right)	●	●	●
Filter (Median, Smoothing, Lowpass, Highpass)	●	●	●
Optimization (AOI Adjustment, AOI Optimization)	○	●	●
<b>Output</b>			
Data (RayCi specific TIF)	●	●	●
Export (TXT / CSV)	●	●	●
Image (BMP / JPEG / GIF / TIFF / PNG)	●	●	●
Sequence Video (AVI)	○	○	●
Protocol (PDF)	○	●	●
Grayscale Image (BMP / GIF / TIFF / PNG)	○	●	●
<b>Import</b>			
Data (RayCi specific TIF)	●	●	●
Import (CSV)	○	○	●
Grayscale Image (BMP / JPEG / GIF / TIFF / PNG)	○	○	●
<b>Control of External Devices</b>			
Linear Stage for M <sup>2</sup>	○	○	●
Trigger Device for Advanced Pulse Measurements	○	○	●

● included    ○ not included    ● on request

