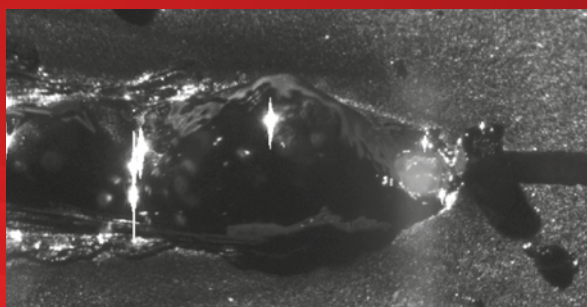


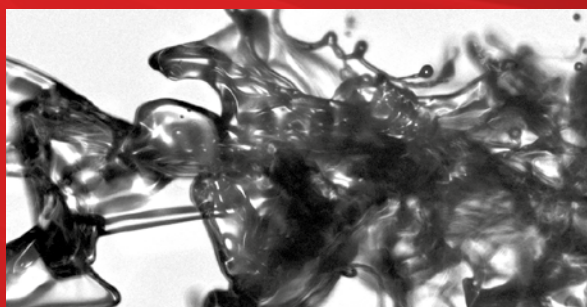
Arc welding using Schlieren imaging – Flow of protection gas



Shockwave formation in gel



Laser welding – Humping effect



Measurement of fluid jets of diesel engine – Double-pulse and back-illumination

# Laser light

for high-speed imaging and monitoring



**Freeze** even the fastest terrestrial motion.

**Even for ultra-high-speed** imaging.

**Accurate imaging** of small and/or fast objects and processes.

**See through heat** and blinding brightness.

**Powerful and versatile lighting** for high-speed imaging and monitoring.

**Variability** through fiber coupling and pulse generation.

**Want to see what you have missed?**

Cavitar Ltd is an expert in illumination lasers

based on diode laser technology.

We offer versatile products, systems and solutions for end-users of R&D applications and integrators of industrial monitoring systems.

[www.cavitar.com](http://www.cavitar.com)

# CAVILUX® Smart

Laser light for high-speed imaging and monitoring

# Welcome to the Invisible World



CAVILUX® Smart System

For high-speed imaging and monitoring

- › Powerful and versatile pulsed diode laser light source designed for high-speed imaging and monitoring
- › Accurate imaging of processes involving extremely small and/or fast objects – without motion blur
- › Visualization of hot and bright objects – without blinding brightness
- › Versatility by varying pulse duration and repetition rate
- › Possibility to generate up to five pulses per one camera exposure
- › Changeable illumination optics provides flexibility
- › Efficient lighting of processes even in limited space and hard-to-reach places
- › Monochromatic and low-coherence light ensures the best possible image quality – without chromatic aberrations or speckle
- › Light is immune to surrounding lighting conditions such as ambient or sunlight, as well as to process vibrations



For visualization of various applications:


- › Flows, droplets, sprays and jets
  - › Shockwave
  - › Schlieren imaging
  - › Welding
- › Industrial webs
  - › Ballistics and explosions
  - › Materials testing

Pulse duration / frequency		
Pulse duration	Normal mode (1)	High-speed mode (2)
* 10 ns	30.000 Hz	100.000 Hz
50 ns	6.000 Hz	20.000 Hz
100 ns	3.000 Hz	10.000 Hz
500 ns	600 Hz	2.000 Hz
1 µs	300 Hz	1.000 Hz
10 µs	30 Hz	100 Hz

\*with reduced output power • (1) duty cycle 0,3 ‰ without time limit • (2) duty cycle 1 ‰ for 10 s

CAVILUX® Smart System

Features

CAVILUX Smart System	
Consists of a control unit, laser unit(s), control software and illumination optics	
One control unit can drive 1...4 laser units (including CAVILUX HF) and synchronize 1...4 cameras	
Can receive or provide 5 V TTL signal for camera synchronization	
Laser unit(s)	
Wavelength options 640 nm (visible) and 810 nm (invisible)	
Output power options for › 640 nm: 200 W and 400 W › 810 nm: 300 W and 500 W	
Laser class 3B or 4 (depending on output power and wavelength)	
Variability through generation of pulses and pulse patterns	
Pulse duration 10 ns ... 10 µs	
Duty cycle 1 % for max 10 s (also ultra-high-speed mode available)	
Continuous mode with 0,3 % duty cycle	
Generation of single pulses or bursts of pulses (max 5 pulses / bursts) at high repetition rate	
Stand-alone operation	
Versatility through changeable fiber optic illumination	
Adjustable illumination with lens (standard solution)	
Direct illumination from fiber optics	
Uniform back-illumination (e.g. shadow imaging)	
Line profile illumination (e.g. flow, welding)	
Light sheet illumination	

CAVILUX® Smart UHS System

For ultra-high-speed imaging

- › Excellent for ultra-high-speed imaging
- › Accurate imaging of processes involving extremely small and/or fast objects – without motion blur
- › Visualization of hot and bright objects – without blinding brightness
- › Versatility by varying pulse duration and repetition rate
- › Changeable illumination optics provides flexibility
- › Efficient lighting of processes even in limited space and hard-to-reach places
- › Monochromatic and low-coherence light ensures the best possible image quality – without chromatic aberrations or speckle
- › Light is immune to surrounding lighting conditions such as ambient or sunlight, as well as to process vibrations



For visualization of various applications:


- › Shockwave
  - › Schlieren imaging
  - › Flows, droplets, sprays and jets
- › Materials testing
  - › Ballistics and explosions

Pulse duration / frequency		
Pulse duration	Normal mode (1)	Ultra-high-speed mode up to 10 MHz (2)
* 10 ns	30.000 Hz	2.000 pulses
50 ns	6.000 Hz	600 pulses
100 ns	3.000 Hz	300 pulses
500 ns	600 Hz	60 pulses
1 µs	300 Hz	30 pulses
10 µs	30 Hz	3 pulses

\* with reduced output power • (1) duty cycle 0,03 ‰ without time limit • (2) duty cycle 99% for 30 µs cumulative laser active time

CAVILUX® Smart UHS System

Features

CAVILUX Smart UHS System	
Consists of a control unit, laser unit and illumination optics	
One control unit can drive 1 laser unit	
Camera synchronization with 5 V TTL signals	
Laser unit	
Wavelength options 640 nm (visible) and 810 nm (invisible)	
Output power options for <ul style="list-style-type: none"><li>› 640 nm: 200 W and 400 W</li><li>› 810 nm: 300 W and 500 W</li></ul>	
Laser class 3B or 4 (depending on output power, wavelength)	
Variability through generation of pulses and pulse patterns	
Pulse duration 10 ns ... 150 ns with 10 ns steps or up to 30 µs following sync pulse duration	
Duty cycle 99 % for max 30 µs cumulative laser active time	
Continuous mode with 0,3 % duty cycle	
Stand-alone operation	
Versatility through changeable fiber optic illumination	
Adjustable illumination with lens (standard solution)	
Direct illumination from fiber optics	
Uniform back-illumination (e.g. shadow imaging)	
Line profile illumination (e.g. flow, welding)	
Light sheet illumination	