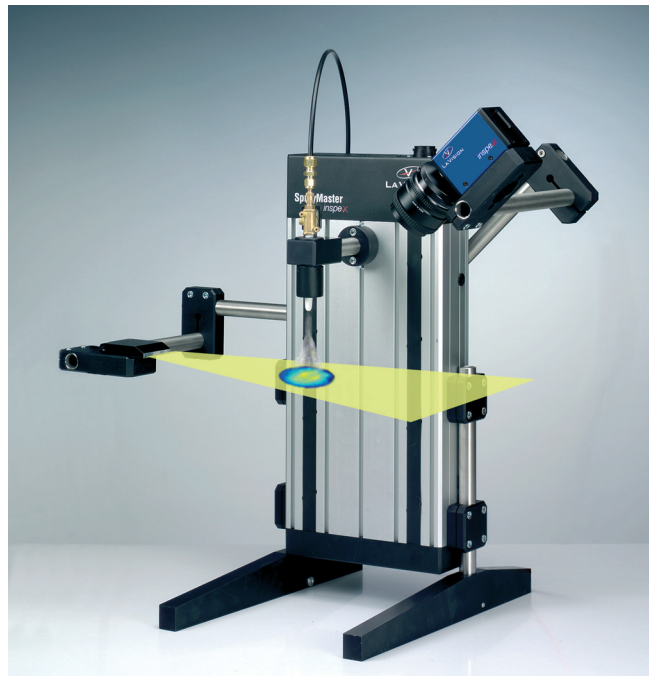


SprayMaster *inspex*

LaVision's **SprayMaster inspex** system is an advanced spray vision system for online and in-situ spray inspection. The modular system design allows light sheet illumination as well as backlight or bright field configurations. Quantitative spray imaging is performed with high spatial and temporal resolution to obtain online information on:

- ▶ geometrical spray analysis, patternation
(spray symmetry, spray angle, tip penetration, statistics)
- ▶ spray density distribution
- ▶ global spray characterization
- ▶ high resolution imaging of single droplets (upgrade option)



The **SprayMaster inspex** system consists of the following parts:

- ▶ light source
- ▶ illumination
- ▶ camera
- ▶ computer
- ▶ trigger unit
- ▶ translation stage (optional)

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Light source



Flash lamp unit

Lamp type	Xenon arc lamp
Repetition rate	up to 40 Hz at full power
Flash duration	0.5-1.5 µs
Max. flash energy¹⁾	total 40 mJ optical
Arc length	1.5 mm (1/16")
Weight	3 kg
Line	100-230 VAC
Inputs	TTL: flash trigger, enable
Lamp lifetime	> 10 ⁹ flashes

¹⁾ light energy at the illumination device is lower and depends on spectral range, input coupler and properties of fiber bundle.

Inputs (BNC connectors at rear side)

Trigger TTL rising edge

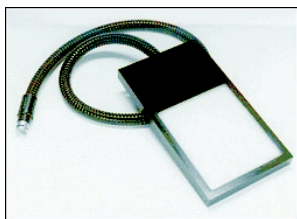
Enable TTL, low = disable trigger, high or open = enable trigger

Illumination

Available illumination devices are:

- ▶ backlight
- ▶ ringlight
- ▶ lightsheet
- ▶ dual fiber

Backlight



Illuminated area	10 x 12.5 cm (4"x 5")
Bundle length	2 m (79") standard (other lengths on request)
Outside dimensions	230 x 125 x 18 mm (9"x 5"x 0.7")
Mount	M6 thread

Ringlight



Fits on objective diameter	47-62 mm (1.85"x 2.4")
Bundle length	2 m (79") standard (other lengths on request)

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Light sheet



Sheet thickness	1.5 mm @ 300 mm distance
Sheet height	130 mm @ 300 mm distance
Dimensions (WxLxH)	95 x 100 x 30 mm (3.75"x 4"x 1.2")
Mount	M6 thread
Bundle length	2 m (79") standard (other lengths on request)

Dual Fiber Bundle



Flexible dual bundle with holders and lenses

Total length	1829 mm (72")
Min. bend radius	15 mm (0.6")
Exit aperture	7.6 mm (0.3")
Including	2x collimating lens 2x bundle holder

Computer and software

State-of-the-art PC compatible computer

- ▶ Windows™ 7 operating system (64 bit)
- ▶ 8 GB RAM
- ▶ DVD-Writer
- ▶ network-card (Ethernet 100 MBit)

LaVision's DaVis software

- ▶ image processing
- ▶ distortion correction

SprayMaster software package

- ▶ browser-like database
- ▶ stack and batch processing
- ▶ control of flash lamp
- ▶ timing control with internal/external trigger
- ▶ support for translation stage, injector driver, crank angle counter
- ▶ geometrical properties of spray
- ▶ spray cone, tip penetration, diameter, profiles

optional:

trigger unit: PTU 9 rotary encoder

Provides synchronization to crank angle encoders. Trigger is related to user defined crank angle.

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Cameras



Type	Imager E-lite 1.4M	Imager E-lite 2M	Imager intense
Frame rate	17 frames/s	14 frames/s	10 frames/s
Exposure time	100 μ s - 80 ms	100 μ s - 80 ms	500 ns – 1000 s (multi exposure)
Spectral range	400 - 850 nm	400 - 850 nm	290 – 1100 nm
Max. QE	59 % @ 545 nm	55 % @ 500 nm	65% @ 500 nm
A/D converter	12 bit	12 bit	12 bit q16 MHz
Lens mount	C-mount	C-mount	C-mount
Active image area	1392 x 1040 (8.9 mm x 6.7 mm)	1628 x 1236 pixels (8.5 mm x 6.8 mm)	1376 x 1040 pixel (8.6 mm x 6.9 mm)
Pixel size	6.45 μ m x 6.45 μ m	4.4 μ m x 4.4 μ m	6.45 μ m x 6.45 μ m
Full well capacity	19,000 e-	9,000 e-	18,000 e-
Readout noise	8 e-	8 e-	4-5 e-
Binning	no	no	1 - 8 (h), 1 - 32 (v)
Dimension (WxHxL)	44 x 29 x 73.7 mm ³	44 x 29 x 73.7 mm ³	93 x 78 x 210 mm ³
Weight	0.16 kg	0.15 kg	1.6 kg

Trigger unit

The trigger unit type PTU 9 standard provides a safe and adjustable connection of the user's system to the **SprayMaster *inspex***.

Resolution

10 nsec

Internal trigger

the system delivers the trigger for the spray system (rate, delay, pulse duration)

External trigger

the user triggers the system

Optional

support for common lasers

For LaVision's PTU 9 please see separate data sheet for detailed description.

Translation Stage

The translation stage enables spatial scanning of the spray under investigation. The stage consists of a driver unit and the motorized stage. Different motion or rotation stages are available on request.

Driving unit



Microprocessor controlled stage driver. The RS-232 protocol of this unit is supported by DaVis.

Size

19" enclosure, 4 HE (height units)

Weight

15 kg

Line voltage

110 or 230 V

For further description see separate data sheet

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Motorized linear stage



Assembly kit

Selection matrix

Standard linear stage

Translation length	280 mm (other distances on request)
Dimensions	500 x 225 x 75 mm (19.7"x 8.9"x 3")

Optional mounting kit for the linear stage. Provides mounting of the camera and lights (backlight and light sheet).

Item	standard	optional
Flash lamp unit	✓	
Backlight	✓	
Ringlight		✓
Light sheet	✓	
Dual bundle		✓
Computer	✓	
Trigger unit	✓	
Imager E-lite 1.4M	✓	
Imager E-lite 2M		✓
Imager intense camera		✓
Trigger unit rotary encoder		✓
Linear translation stage		✓
Assembly kit		✓

Ordering Information

part number	Description
1103201	Flash lamp unit
1108411	Backlight, 2 m length
1108433	Backlight, 7 m length
1108413	Ringlight, 2 m length
1108412	Light sheet, 2 m length
1108434	Light sheet, 7 m length
1108414	Dual fiber bundle, 2 m length
1101024	Imager Intense
1101131	Imager E-lite 1.4M
1101130	Imager E-lite 2M
1108057	PTU 9 standard PCI internal

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