

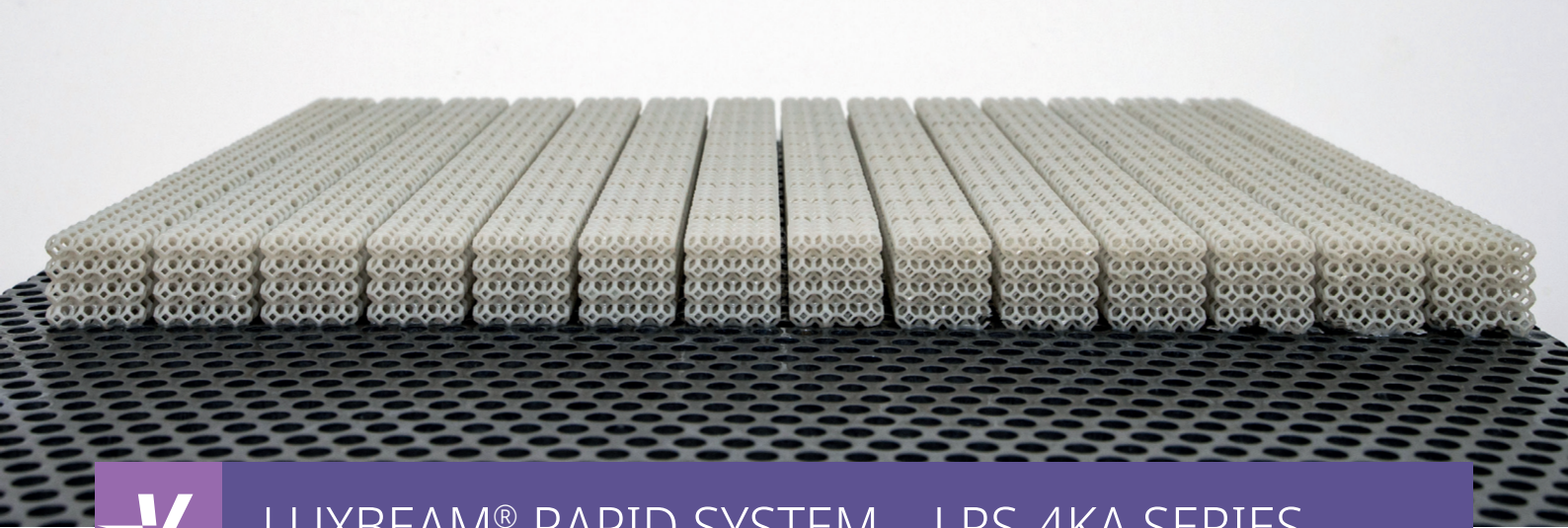
LUXBEAM® RAPID SYSTEM – LRS-4KA SERIES

MORE THAN 8 MILLION ADDRESSABLE PIXEL POSITIONS

# Superior resolution light engine

The LUXBEAM® Rapid System LRS-4KA is specifically designed for static implementations in 3D printing and additive manufacturing systems.

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## LUXBEAM® RAPID SYSTEM – LRS-4KA SERIES

### POWER AND THROUGHPUT

The LRS-4KA projector subsystem makes UV optics, hardware and software work together to deliver high power and high throughput in an easy-to-use, reliable package. Customizing wavelength and projection lens assembly for individual system requirements gives you flexibility.

### HIGHEST RESOLUTION

Designed explicitly for static implementations in 3D printing and additive manufacturing systems, it is a superior resolution DLP®-based stereolithography subsystem with more than 8 million addressable pixel positions – for production of the highest resolution parts.

### PERFORMANCE

Three product performance levels are available, ranging from the air-cooled commodity version for cost-sensitive systems, via an air-cooled version for high-power systems, to the extreme performance, liquid-cooled LRS-4KA LC.

### ADVANCED CONTROLLER

The LC4KA-EKT controller's Full Pixel Sequence Control (FPSC) mode avoids re-sampling errors and gives you full control of the projector's image information. The result is superior finish.

### STACKING POSSIBLE

A slim footprint allows for stacked configurations, yielding 8K, 16K, and higher resolutions. Up to 7W of optical power output makes it the most compact high-power 4K projector at hand.

#### COMMODITY OR PERFORMANCE VERSION?

Using the standard projection lens range, the commodity version is already powerful, cost competitive and best-in-class for desktop engines. The full performance unfolds with optimized full power projection lenses.

# Superior resolution light engine – ideal for static use in 3D printing

### LUXBEAM® RAPID SYSTEM – LRS-4KA SERIES

#### Recommended implementation

- High power static configuration

#### Resolution

- 3840 x 2160 FPSC mode
- 2716 x 1528 native pixel mode

#### LED Wavelengths

- 460 nm / 405 nm / 385 nm / 365 nm

#### Optical Power Output (depending on configuration)

- Liquid Cooled Version:  
Up to 7.5W (with 405 nm), 6.5W (with 385 nm), 3.5W (with 365 nm)
- Performance Version:  
Up to 7W (with 405 nm), 6W (with 385 nm), 3W (with 365 nm)
- Commodity Version:  
Up to 5W (with 405 nm), 4.5W (with 385 nm), 2W (with 365 nm)

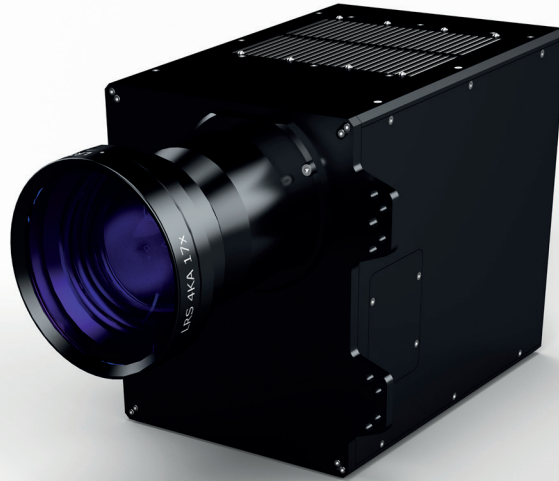
#### Projection Lens Options

- Performance:  
14x, 17x, 24x
- Commodity:  
1.0x, 2.0x, 3.7x, 4.6x, 13x
- More options under development

#### Electronics

- Advanced LC4KA-EKT controller

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## LRS-4KA AC AIR COOLED

The air-cooled LRS-4KA variants achieve superior 4K resolution from the most compact light engine cabinet, allowing implementation into even desktop- and compact standalone machines. Combined with Visitech's extensive range of projection lenses, any need is covered – from static micro-SLA to large formats (up to A4 size). As a result, this is a highly compact and cost-efficient solution for a wide range of additive manufacturing systems.

## LRS-4KA LC LIQUID COOLED

We developed the liquid-cooled product version of the LRS-4KA for stacked configurations with multiple projectors in mind. As a result of the light engine's slim footprint, seamless stitching of projectors allows for large vats at unprecedented resolution. In addition, the liquid-cooling circuit supports improved thermal management – and along with it, longer LED lifetime, less vibration, and superb robustness.

### FULL PIXEL SEQUENCE CONTROL (FPSC MODE) EXPLAINED

The advanced LC4KA-EKT controller of the LRS-4KA projector provides full control of the data content in the projected subframes, with three valuable advantages:

#### NO RE-SAMPLING ERRORS

The controller uses the exact native resolution of the DMD, which allows pixel-pure exposures. This differs from systems using the original DMD reference controller, designed for UHD video inputs, but requiring data re-sampling. Re-sampling causes unwanted pixel errors due to input resolution mismatch between the controller and the DMD.

#### COMPLETE CONTROL OF THE OPTICAL ACTUATOR

You can control both actuator positions timewise on every layer, and apply an image offset of 1/2 pixel to generate better resolution of outer contours in each layer, resulting in better surface finish of the printed objects.

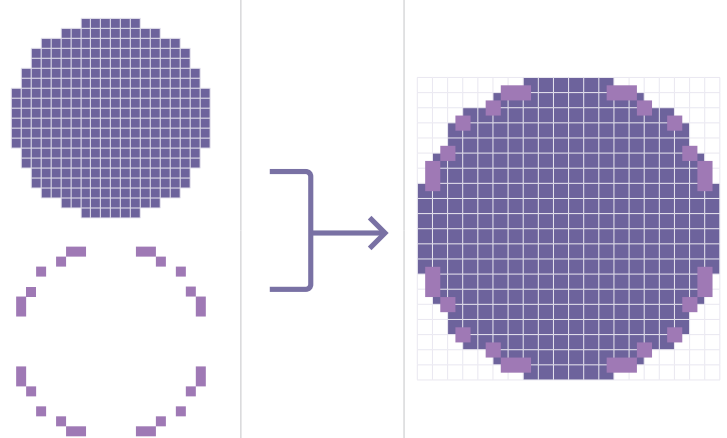
#### FLEXIBLE ARCHITECTURE

Flexible architecture for simple and easy integration with your machine design.

#### NO RE-SAMPLING: Images feed into the DMD at native resolution



#### SMOOTH SURFACE: Control both actuator positions for each layer



# LUXBEAM® Rapid System – LRS-4KA series

Properties			
DMD Type	DLP660TE (2716 x 1528 px)		
Resolution	8,3 million addressable pixels (UHD-4k images with optical actuator)		
Operation Modes	<ul style="list-style-type: none"> <li>• 3840 x 2160 FPSC mode                             <ul style="list-style-type: none"> <li>- Pixel-Pure-Images (2 x WQXGA)</li> <li>- Pure 8-bit grey-scale (No scaling, resampling or gamma/video processing)</li> <li>- Precise actuator timing control</li> </ul> </li> <li>• 2716 x 1528 native pixel mode</li> </ul>		
Projector Output Power	<b>LC version:</b> <ul style="list-style-type: none"> <li>• up to 3.5 W (with 365nm)</li> <li>• up to 6.5 W (with 385nm)</li> <li>• up to 7.5 W (with 405nm)</li> </ul>	<b>AC performance version:</b> <ul style="list-style-type: none"> <li>• up to 3 W (with 365nm)</li> <li>• up to 6 W (with 385nm)</li> <li>• up to 7 W (with 405nm)</li> </ul>	<b>AC commodity version:</b> <ul style="list-style-type: none"> <li>• up to 2 W (with 365nm)</li> <li>• up to 4.5 W (with 385nm)</li> <li>• up to 5 W (with 405nm)</li> </ul>
LED Options	460 nm / 405 nm / 385 nm / 365 nm		
LED Driver	Constant flux with Optical Feedback or Fixed Current		
Power Uniformity	> 90% native in image plane		
Contrast Ratio	ON / OFF: Up to 1200:1 ANSI: Up to 450:1		
Dimensions w/o lens	190 mm (L) x 150 mm (W) x 228 mm (H)		
Total weight	4 kg (w/o lens and PSU)		
Power consumption	200 W (varies with exposure scheme)		
Software	Complete API (Windows, Linux) and GUI		
Features	FPSC Mode, light intensity regulation (optical feedback), adaptive fan control, external frame synchronization, temperature management		

Electrical connections	
Power supply	12 V DC
Video Data	HDMI or DP
Communication	USB
LED Safety Switch	LED enable/disable
Electrical Sync I/O	External frame synchronization

Lens Options	Working Distance [mm]	Pixel Pitch in image [µm]	Feature Size in FPSC / XPR™ mode [µm]	Native Image Size W x H [mm²]
<b>Performance version</b>				
LRS-4KA 14x	500.0	75.0	37.5	204.0 x 115.0
LRS-4KA 17x	524.0	90.0	45.0	244.0 x 138.0
LRS-4KA 24x	832.0	130.0	65.0	353.0 x 199.0
<b>Commodity version</b>				
LRS-WQm 1.0x	71.2	5.4	2.7	14.7 x 8.3
LRS-WQm 2.0x	90.0	10.8	5.4	29.3 x 16.5
LRS-WQm 3.6x	125.5	20.0	10.0	54.3 x 30.6
LRS-WQm 4.6x	180.0	25.0	12.5	67.9 x 38.2
LRS-WQm 13.0x	350.0	70.0	35.0	190.0 x 107.0
Other lens options available upon request.				

All specifications and features subject to change.