

LED Pattern Projector

# LumiBlazeR™

## Features

- Multiple precision reticles
- Patterns: lines, grids, clouds
- Designed for 1" format C-mount lenses
- Multiple wavelengths available
- Multiple operation modes: CW, PWM, Pulsed
- High intensity patterns at long working distances



## Applications

- Vision guided robotics; object ID, pick & place
- 3D metrology: precision shape & volume measurement
- Road pavement inspection: structure and roughness
- Biometrics; gesture recognition
- Surface defect detection

Extremely intense patterns and uniform fields at long working distances enable the use of 3D imaging and illumination in vast, well-lit areas including outdoor locations.

The LumiBlazeR™ is a high-power LED fixed-pattern projector for structured lighting and stereovision in 3D machine vision with various reticle and working distance options. A near infrared version is suited for video identification in long-range CCTV security and surveillance.

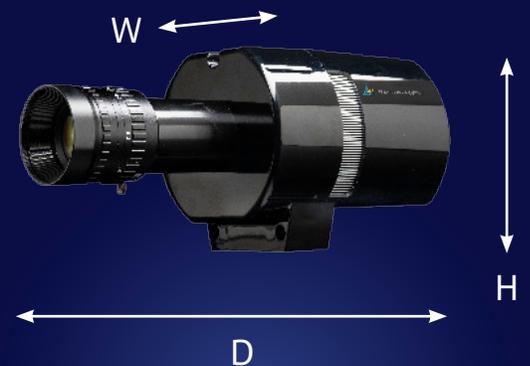
The LumiBlazeR™ projects patterns with an intensity that is at least 5X to 10X greater than other “high-power” LED pattern projectors for similar pattern size, working distance, and wavelength.

# LumiBlazeR™ Operating Specifications

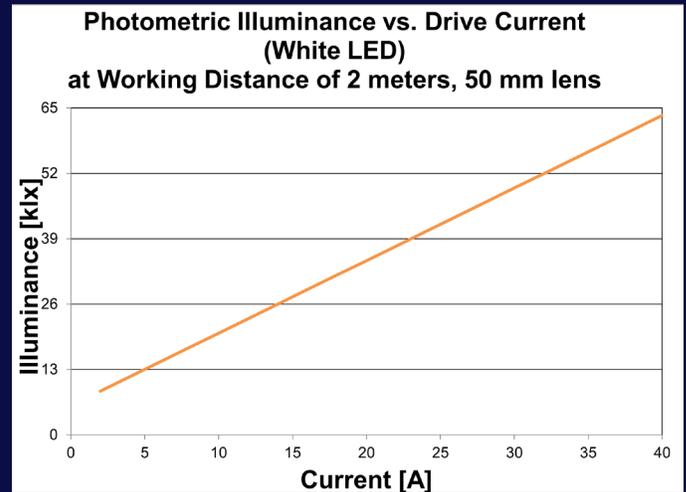
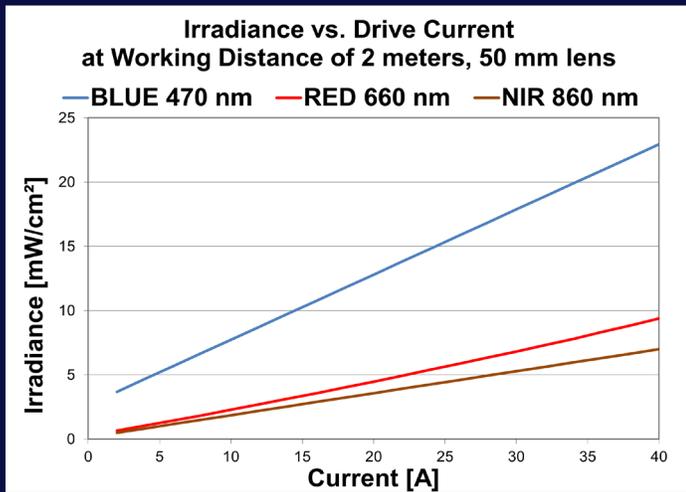
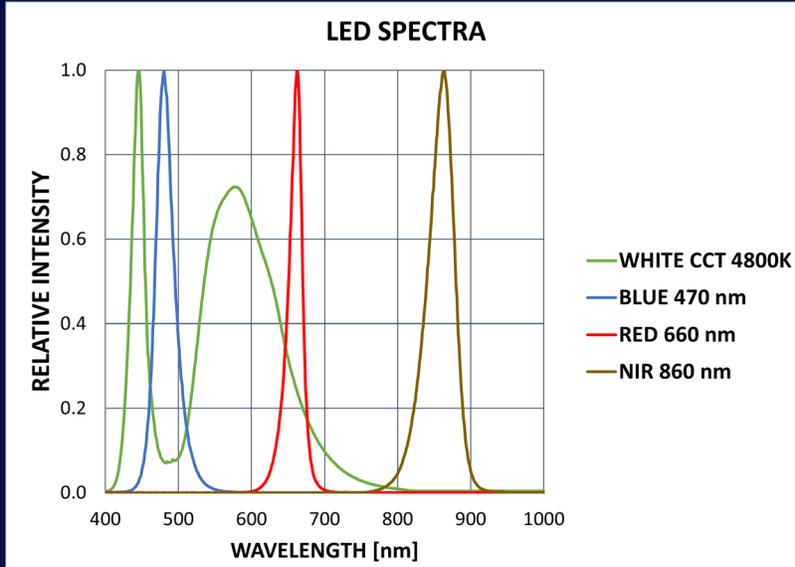
Parameter	Specification	Comment
LED Wavelengths	Blue	Peak wavelength 470nm (typ.)
	White	CCT 4800K (typ.)
	Red	Peak wavelength 660nm (typ.)
	NIR	Peak wavelength 860nm (typ.)
Drive Current	Continuous 40A max.	Wavelength dependant
	Pulsed 50A max.	30% duty cycle maximum
Forward voltage	Limit: 5.0V	Requires constant current operation
Total drive power	250 Watts max.	At max drive current
Electrical connector	D-SUB 7W2	Power and comms, internal shielding
Cooling	Forced air	PWM smart control
Operating environment	15°C to 35°C	5% to 85% relative humidity, non-condensing
Operating temperature	040°C to 40°C	Depending on drive conditions
Weight	0.8 kg	Without lens attached < 100 power consumption

## Dimensions

Height	Width	Depth
95 mm	155 mm	92.5 mm

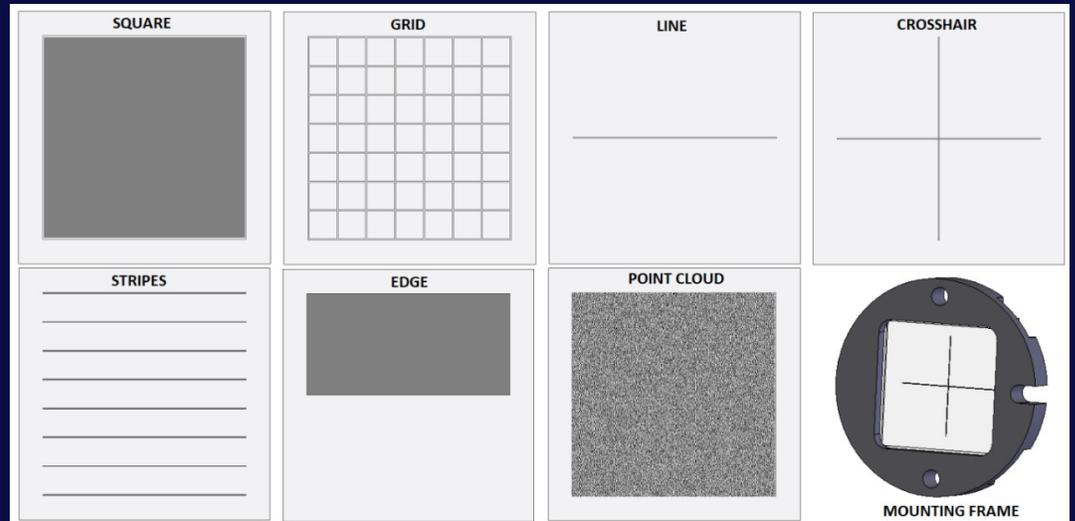


# LumiBlazeR™ LED Characteristics



# LumiBlazeR™ User Changeable Pattern Reticles

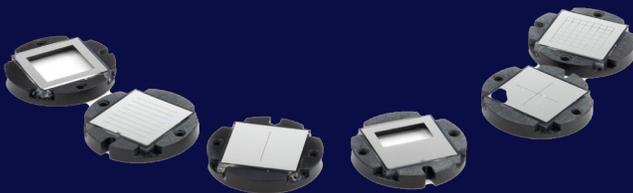
- Sold separately
- Easily changeable
- Line width 70 microns
- For 1" format lenses



The LumiBlazeR™ employs precision reticles patterned by photolithography which produce thinner lines, sharper edges and more homogeneous illumination. There are seven standard optical patterns available supplied in interchangeable mounting frames. The patterns are sized to fill the field of 1" format C-mount camera lenses. The line width of patterns with lines is 70 μm.

## Pattern Options and Notes

Offered in 11.3mm



SQ1	Square
GD1	Grid
LR1	Line - Horizontal/Vertical
CR1	Crosshair
L81	Stripes - Horizontal/Vertical
RO1	Edge
DO1	Point Cloud

- Reverse negative images: dark grey areas are the projected light patterns
- Custom patterns can be fabricated upon request
- Edge pattern rotation specified at time of order (North-shown, South, East, or West)

# LumiBlazeR™ Lenses

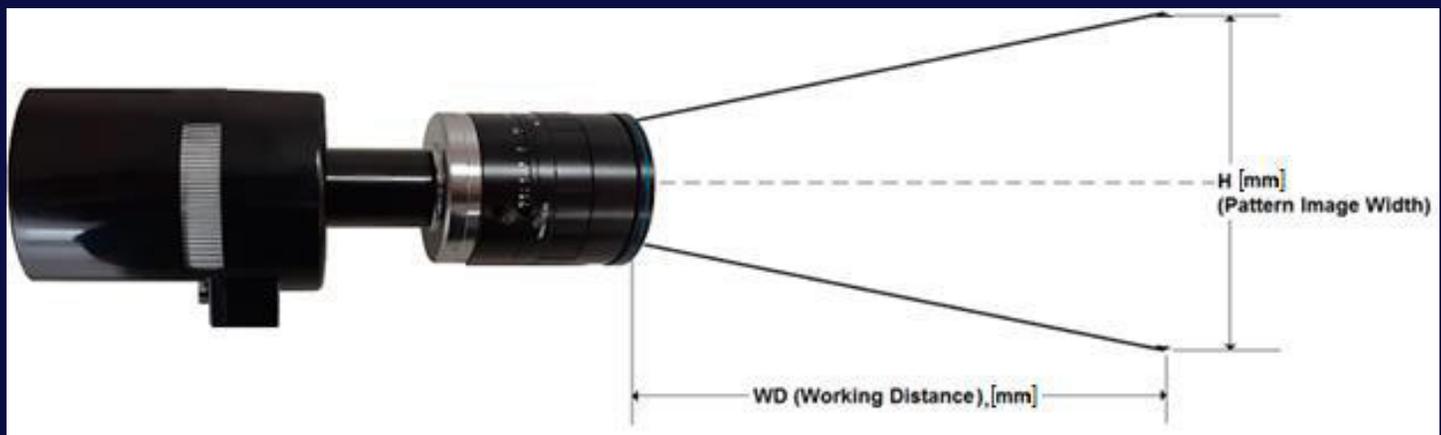
The LumiBlazeR™ field of view is designed for 1” format C-mount lenses. Smaller field of view lenses can be used but will suffer from a higher drop in the intensity with field angle. High speed (low F/#/high NA) lenses produce the brightest pattern images.

*Special high uniformity lenses available for non-reticle version LumiBlaze™ (Contact Sales).*

Lens Option	LO1	LO2	LO3	LO4	LO5	LO6	LO7
Focal Length	6.5	12.5	17	25	35	50	75
F/#	1.4	1.4	0.95	0.85	1.4	0.85	1.8
FOV	82°	49°	37°	25°	18°	13°	9°
Min. Object Distance	150 mm	100 mm	500 mm	170 mm	200mm	240 mm	900 mm
Distortion @ 1m WD	8.0%	-2.1%	9.7%	1.2%	-0.15%	-0.60%	-0.06%
Spectral range (nm)	400 - 950	400 - 1000	400 - 1000	400 - 1000	400 - 1000	400 - 1000	400 - 1000
Dimensions (mm)	φ46 x L44	φ51 x L68.5	φ42 x L80.7	φ65 x L85.5	φ51 x L48.5	φ65 x L81.5	φ51 x L76.0

*\*FOV is based on the 11.3 mm width and length of the pattern reticles.*

## Optical Performance with Grid Pattern



# LumiBlazeR™ Optical Performance with Grid Pattern (cont.)

**Table 1.**  
Pattern Image Width H (Pattern Linewidth) [mm]

		WD (Working Distance), [mm]									
		200	300	500	750	1000	2000	4000	6000	8000	10,000
Lens Focal Length [mm]	6.5	409 [2.5]	613 [3.8]	1021 [6.3]	1532 [9.5]	2043 [12.7]					
	12.5	201 [1.2]	290 [1.8]	468 [2.9]	691 [4.3]	914 [5.7]	1806 [11.22]	3589 [22.2]			
	17			390 [2.4]	582 [3.6]	774 [4.8]	1544 [9.6]	3084 [19.1]			
	25	96 [0.6]	142 [0.9]	232 [1.4]	345 [2.1]	458 [2.8]	911 [5.6]	1815 [11.2]	2720 [16.8]	3624 [22.5]	
	35		123 [0.8]	186 [1.2]	265 [1.6]	343 [2.1]	658 [4.1]	1286 [8.0]	1915 [11.9]	2543 [15.8]	3171 [19.6]
	50		74 [0.5]	120 [0.7]	177 [1.1]	234 [1.4]	462 [2.9]	918 [5.7]	1375 [8.5]	1831 [11.3]	2287 [14.2]
	75					158 [1.0]	317 [2.0]	636 [3.9]	955 [5.9]	1273 [7.9]	1592 [9.9]

**Table 2.**  
Pattern Irradiance [mW/cm<sup>2</sup>]  
Blue LED, On-axis  
20A Drive Current

		WD (Working Distance), [mm]									
		200	300	500	750	1000	2000	4000	6000	8000	10000
Lens Focal Length [mm]	6.5	8.5	3.9	1.4	0.6	0.4					
	12.5	81	35	12	5.2	2.9	0.7	0.2			
	17			23	10.4	5.9	1.5	0.4			
	25	279	130	49	23	13	3.6	1.0	0.4	0.3	
	35		266	98	45	25	6.6	1.7	0.8	0.4	0.3
	50		480	181	83	48	13	3.4	1.6	0.9	0.6
	75					82	17	3.6	1.4	0.7	0.5

**Table 3.**  
Pattern Irradiance [mW/cm<sup>2</sup>]  
Red LED, On-axis  
20A Drive Current

		WD (Working Distance), [mm]									
		200	300	500	750	1000	2000	4000	6000	8000	10000
Lens Focal Length [mm]	6.5	4.9	2.1	0.7	0.3	0.2					
	12.5	17	7.6	2.8	1.2	0.7	0.2	0.0			
	17			5.8	2.6	1.5	0.4	0.1			
	25	72	33	13	5.9	3.4	0.9	0.2	0.1	0.1	
	35		63	23	11	6.0	1.6	0.4	0.2	0.1	0.1
	50		133	50	23	13	3.5	0.9	0.4	0.3	0.2
	75					21	4.5	0.9	0.4	0.2	0.1

# LumiBlazeR™ Optical Performance with Grid Pattern (cont.)

**Table 4.**  
**Pattern Illuminance [klx]**  
**White LED, On-axis**  
**20A Drive Current**

		WD (Working Distance), [mm]									
		200	300	500	750	1000	2000	4000	6000	8000	10000
Lens Focal Length [mm]	6.5	24	11	4	2	1					
	12.5	190	85	31	14	8	2	1			
	17			62	28	16	4	1			
	25	802	372	141	66	38	10	3	1	1	
	35		703	260	118	67	17	5	2	1	1
	50		1601	573	254	142	35	9	4	2	1
	75					236	49	10	4	2	1

**Table 5.**  
**Pattern Irradiance [mW/cm<sup>2</sup>]**  
**NIR LED, On-axis**  
**20A Drive Current**

		WD (Working Distance), [mm]									
		200	300	500	750	1000	2000	4000	6000	8000	10000
Lens Focal Length [mm]	6.5	3.8	1.6	0.5	0.2	0.1					
	12.5	19	8.5	3.1	1.4	0.8	0.2	0.005			
	17	36	16.4	6.0	2.7	1.5	0.4	0.1			
	25	74	34	13	6.1	6.5	0.9	0.3	0.1	0.07	
	35		61	23	10	5.8	1.5	0.4	0.2	0.1	0.07
	50		69	26	12	6.9	1.8	0.5	0.2	0.1	0.08
	75					23	4.8	1.0	0.4	0.2	0.1

# LumiBlazeR™ 5000H LED Driver/Controller



Parameter	Specification	Comment
Type	1 Channel constant current, dimmable	Continuous or pulsed by external trigger
Output Voltage	Determined by LED module	Drive current compliance voltage
Output Current	1 to 40 ADC	Continuous
	50 ADC max.	Pulsed/Max 30% duty factor
Output Voltage Range	Minimum output voltage	1.2 VDC
	Maximum output voltage	7.0
Input Voltage	+24 VDC +/- 5%	300W* typical for 40A output (Driver Capability)
Efficiency	77% typical	At 40A output
Current ripple	2% (P-P)	At 25 ADC output current and 95W output power
Dimming	Analog	Potentiometer
	Digital	via MODBUS
External Trigger	3.3V TTL	User enabled
	50 µsec min pulse width. 250 Hz - 2kHz switching frequency	With 1M long driver cable
LED Module I/O	Thermistor in LED Module	Monitoring
	Fan power (24 VDC) and PWM	Cooling, intelligent control
Connectivity	RS - 485 (Modbus Protocol)	
Size and Weight	168.3 (W) x 142 (D) x 46.5 (H) mm., 1.0 kg.	

The products, their specifications and other information appearing in this document are subject to change by Innovations in Optics, Inc. (IOI) without notice. IOI assumes no liability for errors that may appear in this document, and no liability otherwise arising from the application or use of the product or information contained herein.