LumiBlazeR™
LED Pattern Projector

LumiBlaze™
LED Projector

-< Features >-

- High intensity patterns at long working distances
- Multiple precision reticles
- Designed for 1” format C-mount lenses
- Multiple wavelengths available
- Multiple operational modes: CW, PWM, Pulsed

-< Applications >-

- Vision guided robotics; object ID, pick & place
- 3D metrology; precision shape and volume measurement
- Road pavement inspection; structure and roughness
- Biometrics; gesture recognition
- Flood source illuminator
- Illumination for night guidance
- Inspection
- Surface defect detection
- Depth measurements

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.

The no-reticle flood illuminator, LumiBlaze™, is uniquely designed for applications that require a highly uniform field of high brightness.

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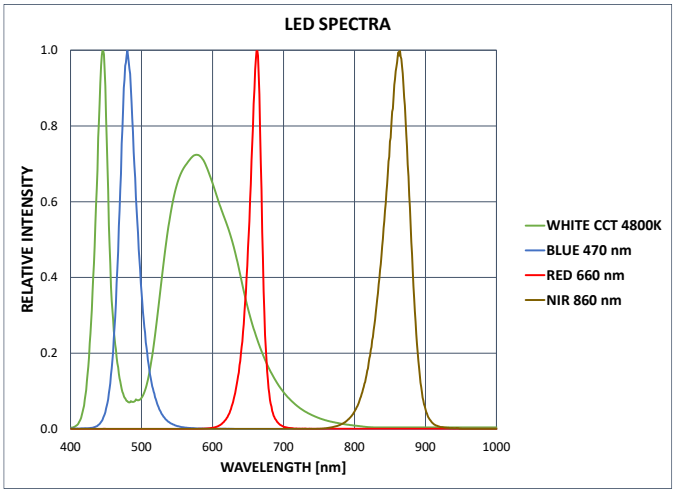
LumiBlazeR™

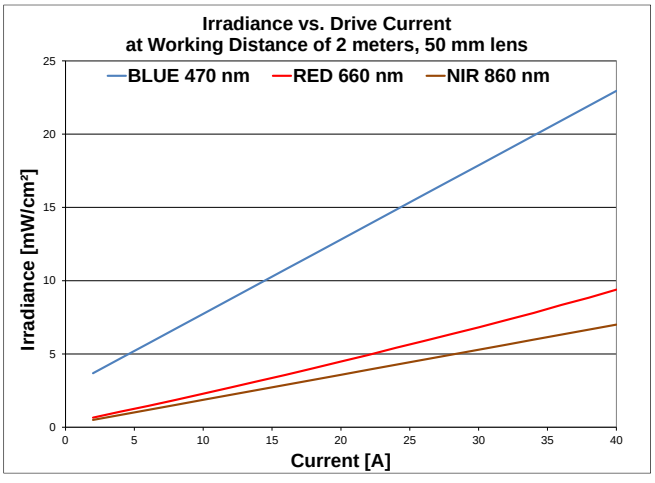
LumiBlazeR™ Operating Specifications

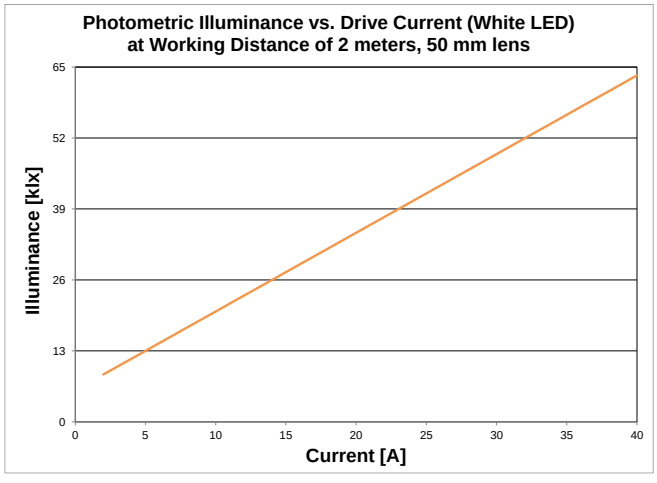
PARAMETER	SPECIFICATION	COMMENT
*LED wavelengths**	Blue White Red NIR	Peak wavelength 470 nm (typ.) CCT 4800K (typ.) Peak wavelength 660 nm (typ.) Peak wavelength 860 nm (typ.)
Drive current	Continuous 40A max. Pulsed 50A max.	Wavelength dependent 30% duty cycle maximum
Forward voltage	Limit: 5.0 V	Requires 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 temperature	-40 °C to 40 °C	Depending on drive conditions
Size and Weight	155 (W) x 92.5 (D) x 95 (H) mm, 0.8 kg	Without lens attached
Lifetime (hours)	-	Depends on drive conditions and temperature

**Peak wavelength and CCT vary with drive current*

LED Characteristics







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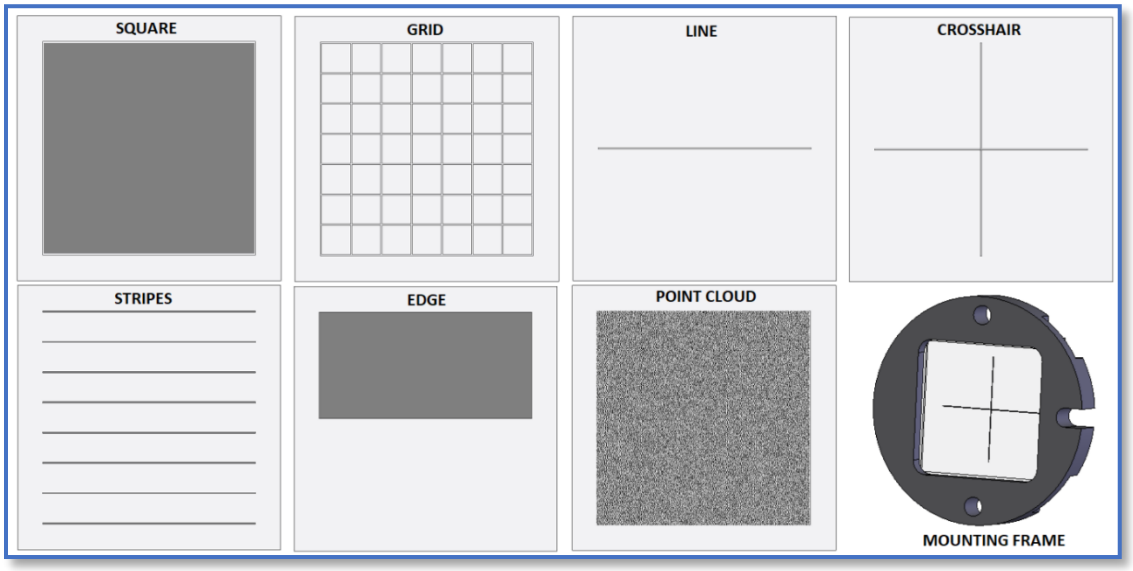
User Changeable Pattern Reticles

- Sold separately
- Line width 70 µm
- Easily changeable
- 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 linewidth of patterns with lines is 70 µm.

Pattern Options and Notes

Option	Pattern
PAT1	Square
PAT2	Grid
PAT3	Line – Horizontal/Vertical
PAT4	Crosshair
PAT5	Stripes – Horizontal/Vertical
PAT6	Edge
PAT7	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)*

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 LumiBlaze™ (Contact Sales).

C-Mount Lens Selections

Option No.:	LENS1	LENS2	LENS3	LENS4	LENS5	LENS6	LENS7
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	200 mm	240 mm	900 mm
Distortion at ≈1m WD:	8.0%	-2.1%	9.7%	1.2%	-0.15%	-0.60%	-0.06%
Spectral Range:	400 -950 nm	400 -1000 nm	400 -1000 nm	400 -1000 nm	400 -1000 nm	400 -1000 nm	400 -1000 nm
Dimensions:	φ46 × L44 mm	φ51 × L68.5 mm	φ42 × L80.7 mm	φ65 × L85.5 mm	φ51 × L48.5 mm	φ65 × L81.5 mm	φ51 × L76.0 mm

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

LumiBlazeR™ Optical Performance with Grid Pattern

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LumiBlazeR™ Optical performance with Grid Pattern (con't)

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

Lens Focal Length [mm]	WD (Working Distance), [mm]									
	200	300	500	750	1000	2000	4000	6000	8000	10,000
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/cm²]
Blue LED, On-axis
20A Drive Current

Lens Focal Length [mm]	WD (Working Distance), [mm]									
	200	300	500	750	1000	2000	4000	6000	8000	10000
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/cm²]
Red LED, On-axis
20A Drive Current

Lens Focal Length [mm]	WD (Working Distance), [mm]									
	200	300	500	750	1000	2000	4000	6000	8000	10000
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

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LumiBlazeR™ Optical performance with Grid Pattern (con't)

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

Lens Focal Length [mm]	WD (Working Distance), [mm]									
	200	300	500	750	1000	2000	4000	6000	8000	10000
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/cm2]
NIR LED, On-axis
20A Drive Current

Lens Focal Length [mm]	WD (Working Distance), [mm]									
	200	300	500	750	1000	2000	4000	6000	8000	10000
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

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5000H LED Driver/Controller

LED Driver/Controller Operating Specifications

PARAMETER	SPECIFICATION	COMMENT
Type	1 Channel constant current, dimmable	Continuous or pulsed by external trigger
Output Voltage	Determined by the LED module	Drive current compliance voltage
Output Current	2 to 40 ADC 50 ADC Max	Continuous Pulsed
Input Voltage	+24 VDC +/- 5%	200W typical for 40A output
Efficiency	77% typical	at 40A output
Current Ripple	2% (P-P)	at 25ADC output current and 95W output power
Dimming	Analog Digital	Potentiometer via MODBUS
External Trigger	3.3V TTL 50 □sec min pulse width 250 Hz - 2 kHz switching frequency	user enabled with 1m long driver cable
LED Module I/O	Thermistor in LED module Fan power (24 VDC) and PWM	monitoring 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	

