Structured LED Lighting

DATASHEET EFFI-LASE-V2 Version 3.5 Last update: October 28, 2024



PASSIVE Version

Very intense and uniform illuminated area Full range of colors: from UV to IR, white Long lifetime and few maintenances Compatible with most objectives (C-Mount) High depth of field for line version No speckle

		PSV (Passive cooling)
Electronics	Connectors	M12, 5 Contacts (with LED driver)
	Power supply	24V DC
	Illumination mode	Continuous or strobe mode
	Power consumption	45 W to 90W (depending on the number of LEDs)
Optics	Wavelength	Various wavelengths (from UV to IR, white)
	Projected pattern	Various designs for alignment, 3D profiling and stereovision / Switchable
Mechanics	Weight	400 g
	Width x length	79.1 mm x 129.6 mm (without the objective)
	Objective adjustment	C-mount adaptor on the projector
	Fastener	8 x M5 holes on the sides of the device
	Material	Device body: Aluminum alloy
Environment	Working temperature	0°C to 40°C
	IP code	IP54 (PSV)

Applications

EFFI-LASE



Stereovision and 3D profiling

Camera



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EFFI-LASE (up) vs. Laser (down): No speckle = more accurate



Part Number



Reference: Passive: EFFI-LASE- PSV -XXX-YYY-ZZZ									
XXX: LED Version									
L	X1*(recommended ;	for Line pattern)		MX	MX1 MX2*(strobe mode only)				
			EL-SM-002818 DK 4756-V2.0 FN 94V0 FN						
	۲۱	(Y : Wavelen	gth (nm) / C	Color (othe	er wavelength	s available on demand)			
• UV 38	85 – 395 – 405	• Blue 465	• Green 525	• Red 62	5 • IR 850	○ White 000 (T°= 5500 K ±	500 K)		
		ZZ	Z: Type of	Mask (cus	tom masks ar	re possible)			
	3D Profilo	metry (line le	ngth: 13mm)		Stereovision and Alignment (A01/A02/A03)				
L01 1 line: 50 μm				G01 Round Ø50 μm Step: 100μm, Effective mask: 10x10mm ²					
L02 1 line: 20 μm				G02Round Ø50 μmStep: 100μm, Effective mask: 13x13mm²					
L03 1 line: 10 μm				G03Grid 40*40, lines 50µm thickStep: 255µm, Effective mask: 10x10mm²					
L04 3 lines: 50 μm <i>separated by</i> 500 μm				G04 (Step: 255μm,	Grid 50*50, lines 50µm thick Effective mask: 12,5x12,5mm²				
L05	3 lines: 50 µn	n separated b	γ 200 μm		G05 100 Step: 100μm,	*100 Squares, 50x50µm² each Effective mask: 10x10mm²			
L06 5 lines: 50 μm <i>separated by</i> 750 μm				C02 Cl Effective mas	oud of dots density 50% k: 12,8x9,6mm²				
L07 100 lines: 45 μm <i>separated by</i> 112,5 μm				C03 Cloud of dots density 17% Effective mask: 12,8x9,6mm ²					
L08	L08 22 lines: 50 μm <i>separated by</i> 350 μm			A01 Cross Line thickness: 50µm, Line length: 13mm					
L09 1 line: 5 μm				<mark>A02</mark> Thick.: 50µm,	26 Concentric circles Step: 250µm, Central: Ø30µm				
L41	1 line 75 µr separat	m + 40 lines 4 ted by 200 μm	l5 μm 1		A03 Line thickness	Square s: 50µm, Line length: 10mm			



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Electronical considerations



Contact arrangement

The EFFI-LASE is supplied with a 24V constant voltage. The characteristics below are true for **PSV** version.

CONVENTION CABLE M12								
Pin number	Cable color	or Contact arrangement Designation Details		Max Power Consumption (with MX2 LED version)				
1	Brown		+24V	+24V	3.75A@24V (strobe) 1,25A@24V (continuous)			
2	White	450	NPN	NPN [triggered on falling edge] - Max 24V (Light ON if V _{NPN} < 1.5 V / OFF if V _{NPN} > 3V)	12mA@3,5V 3mA@5V 0,5mA@10V 0,15mA@24V			
3	Blue		GND	GND	/			
4	Black	M12 male connector	PNP	PNP [triggered on rising edge] - Max 24V (Light ON if V _{PNP} > 4.5 V / OFF if V _{PNP} < 3V)	12mA@24V 3mA@10V 0,5mA@5V 0,15mA@3,5V			
5	Grey		AIC*	AIC (Analog Intensity control) * - Max 24V	0,1mA@0V 0,3mA@5V 1mA@10V 3mA@24V			

*If the AIC is not connected, the light will light on at 100% as if V_{AIC}=24V. If you don't need to adjust light level do not connect/use this PIN.

Strobe mode

The LED driver inside the product is set to automatically pulse the LED. If you trigger light for a short pulse (< 100 μ s), light is pulsed (LED are driven at 2A). If your pulse is longer, light automatically decreases LED current to protect LED against failure.

To protect LED, the product will enter in protection mode (Light is OFF for 2 second) if the duty cycle is superior to 0.3. Every 2 seconds, the product will check if duty cycle is correct to restart.



If D=Duty cycle (ON TIME / (ON TIME + OFF TIME)) > 0.3 → Light shutdowns for 2 seconds



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Continuous mode

If you set trigger NPN continuously ON (or PNP), the light will run continuously with a 700 mA LED current.

LED current (A)



Power consumption of the EFFI-Lase V2 PSV							
LED version	Power consumption – Max (2A)						
LX1 / MX1	15 W	45 W					
MX2	No continuous	90 W					

Analog Intensity Control (AIC)

By adjusting the analog tension, light intensity can be controlled from 10% to 100%. If the Input AIC is not connected, the EFFI-LASE will act as if AIC was set at 24V.



Temperature protection

The EFFI-LASE is protected against over warming.

If LED temperature exceeds 80°, the light is automatically switched off. The EFFI-LASE will restart itself as soon as temperature is below 70°C.



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LASE.

Any C-mount objective (accessory) can be mounted

on the EFFI-LASE. Objectives are not sold with EFFI-

To guarantee the quality of the projector, the pattern is directly mounted in the projector body. However, the pattern can be observed through the aperture of the projector. Avoid any sharp contact with the mask:

this one is sensitive and can easily be damaged.

Optical considerations



C-Mount Objective (not included)

Objective selection

EFFILUX recommends using one of the following objectives with the EFFI-LASE-V2 :

1" Lenses :

	EFFO-KW-6- F1.8-1"-HR-CM	EFFO-KW-8- F1.4-1"-HR-CM	EFFO-RC-12.5- F1.8-1"-LR-CM	EFFO-KW-16- F1.4-1"-HR-CM	EFFO-VS-25- F1.4-1"-LR-CM	EFFO-KW-35- F1.4-1"-HR-CM	EFFO-RC-50- F1.4-1"-LR-CM	EFFO-KW-75- F1.8-1''-HR-CM
Distance focale (mm)	6	8	12.5	16	25	35	50	75
Ouverture du diaphragme	F1.8	F1.4	F1.8	F1.4	F1.4	F1.4	F1.4	F1.8
Angle de vue (HxV)	96.8°x79.4°	79.4°x63°	55.5°	44.3°x33.6°	16.1° x 19.0°	20.9°x15.8°	14.4°	9.7° x 7.3°
Monture de filtre	x	M55 P=0.75	M40.5 P=0.5	M35.5 P=0.5	M27 P=0.5	M35.5 P=0.5	M46 P=0.75	M46 P=0.75

2/3" Lenses :

	EFFO-VS-8-F1.3- 2/3"-LR-CM	EFFO-KW-12-F1.4- 2/3''-HR-CM	EFFO-VS-16-F1.4- 2/3"-LR-CM	EFFO-VS-25-F1.4- 1"-LR-CM*	EFFO-VS-35-F1.8- 2/3"-LR-CM	EFFO-VS-50-F1.8- 2/3"-LR-CM	EFFO-KW-75-F2.5- 2/3"-HR-CM
Distance focale (mm)	8	12	16	25	35	50	75
Ouverture du diaphragme	F1.3	F1.4	F1.4	F1.4	F1.8	F1.8	F2.5
Angle de vue (HxV)	49.0° x 57.2°	30.0° x 22.7°	24.6° x 28.9°	16.1° x 19.0°	11.7° x 13.8°	8.5° x 10.0°	6.7°×5.0°
Monture de filtre	M25.5 P=0.5	M25.5 P=0.5	M27 P=0.5	M27 P=0.5	M27 P=0.5	M30.5 P=0.5	M34 P=0.5

Depending on the working distance (WD) and the C-mount objective selected, different pattern sizes are obtained:

Objective	Line width (mm) Mask dimensions: 13mm x 50μm (LO1)					
,	WD = 30cm	WD = 50cm	WD = 80cm	WD = 100cm		
f = 12.5 mm	1.27	2	3.19	4		
f = 16 mm	1.01	1.58	2.40	3		
f = 35 mm	0.42	0.71	1.13	1.40		
f = 50 mm	0.30	0.49	0.78	0.98		
f = 75 mm	n.a	n.a	0.51	0.63		

*There could be a difference between measured size and indicated values.



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The relation between the line width and the working distance is linear. For a 50µm mask width, the following graphs are obtained:



Objective	Pattern dimensions HxW (cm) Dimensions of a 12.8x9.6mm cloud of dots pattern (CO2)					
•	WD = 30cm WD = 50cm WD = 80cm		WD = 100cm			
f = 12.5 mm	32 x 23	51 x 37	82 x 59	102 x 73		
f = 16 mm	25 x 19	41 x 31	66 x 49	82 x 61		
f = 35 mm	11 x 8	18 x 14	29 x 22	36 x 27		
f = 50 mm	n.a	12 x 9	20 x 15	25 X 19		
f = 75 mm	n.a	n.a	13 x 10	16 x 12		



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The lines of the LXX masks are oriented perpendicular to the connector axis as illustrated under.





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Configurations





The selection between configuration 1 and configuration 2 depends on the object to observe: either the specular reflection needs to be captured (configuration 1) or reflections different from the specular reflections (configuration 2) are considered.

Use the fixings that you can see on the mechanical considerations to place and fix the EFFI-LASE correctly and efficiently.



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Verify your alignment between LED and mask

This part concerns you only if you got A LINEAR LED VERSION (LX1). To have an optimized depth of field, you need to align the mask with the LEDs. We recommend to use linear masks for the LX1 LED Version, the mask used is the L03 (one line) for the example. We apologize for the darkness of the pictures, we needed to show you the light form to help you to align correctly your mask. N.B: Always checking the step 7 by adjusting the objective!



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Remember that the "Change the mask" part works with all the EFFI-LASE Version (PSV & CPT) even if the pictures are with a CPT. <u>N.B</u>: If you did not to succeed the steps for one of the three parts. Please feel free to contact us.



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