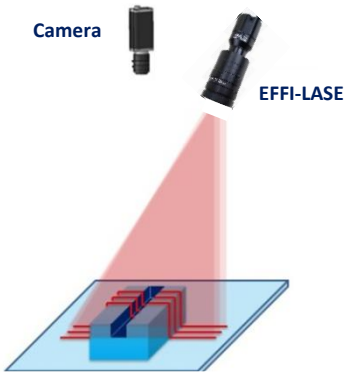
COMPACT Version

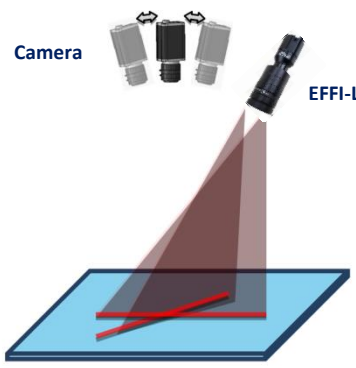
Very intense and uniform illuminated area
Full range of colors: from UV to IR, white
Long lifetime and few maintenances
Compatible with most objectives (C-Mount)
High depth of field for line version
No speckle

		Compact version: CPT
Electronics	Connectors	M8, 8 Contacts (no LED driver=no protection)
	Power supply	⚠ Direct current
	Illumination mode	Strobe mode only or low constant current (no cooling system)
	Power consumption	Depending on current and LED version
Optics	Wavelength	Various wavelengths (from UV to IR, White)
	Projected pattern	Various designs for alignment, 3D profiling and stereovision / Switchable
Mechanics	Weight	200g
	Width x length	42mm x 71mm (without the objective)
	Objective adjustment	C-mount adaptor on the projector
	Fastener	8 x M5 6H
	Material	Device body: Aluminum alloy
Environment	Working temperature	0°C to 40°C
	IP code	IP54

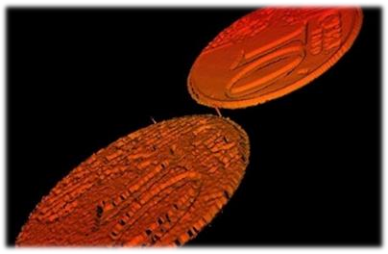
Applications



Stereovision and 3D profiling



Alignment applications



EFFI-LASE (up) vs. Laser (down)

No speckle = more accurate

Part Number

Reference:
Compact: EFFI-LASE-**CPT**-XXX-YYY-ZZZ

XXX: LED Version

LX1**(*recommended for Line pattern)*	MX1	MX2	MX3
			

YYY: Wavelength (nm) / Color (*other wavelengths available on demand*)

• UV 385 or 395 or 405	• Blue 465	• Green 525	• Red 625	• IR 850	○ White 000 (T°= 5500 K ± 500 K)

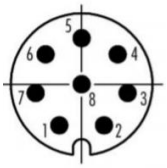
ZZZ: Type of Mask (custom masks are possible)

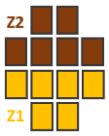
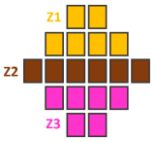
3D Profilometry (*line length: 13mm*)		**Stereovision and Alignment**	
L01	1 line: 50 µm	G01	Round Ø50 µm Surface (mm²) 10x10 *separated by* 50 µm
L02	1 line: 20 µm	G02	Round Ø50 µm Surface (mm²) 13x13 *separated by* 50 µm
L03	1 line: 10 µm	G03	Grid 40*40, lines 50 µm Surface (mm²) 10x10 *separated by* 50 µm
L04	3 lines: 50 µm *separated by* 500 µm	G04	Grid 50*50, lines 50 µm Surface (mm²) 13x13 *separated by* 50 µm
L05	3 lines: 50 µm *separated by* 200 µm	G05	Square 50*50 µm² Surface (mm²) 10x10 *separated by* 100 µm
L06	5 lines: 50 µm *separated by* 750 µm	C02	Cloud of dots density 50% Surface (mm²) 12,8x9,6
L07	100 lines: 45 µm *separated by* 67,5 µm	C03	Cloud of dots density 17% Surface (mm²) 12,8x9,6
L08	22 lines: 50 µm	A01	Cross 50 µm Line length: 13mm
L09	1 line: 5 µm	A02	Concentric circles
L41	1 line 75 µm + 40 lines 45 µm	A03	Square 50*50 µm² Line length: 10mm

Electronical considerations

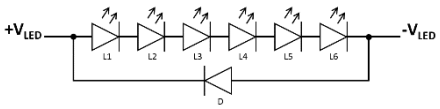
Contact arrangement

The EFFI-LASE-CPT is supplied with a direct current through the M8-8 PINS (male).

CONVENTION CABLE M8					
Pin number	**Cable color**	**Contact arrangement**	**With MX1 or LX1**	**With MX2**	**With MX3**
1	White	 M8 8 PINS (male)	$-V_{LED}$	$-V_{LED}$ n°1 (Z2)	$-V_{LED}$ n°1 (Z2)
2	Brown		$+V_{LED}$	$+V_{LED}$ n°1 (Z2)	$+V_{LED}$ n°1 (Z2)
3	Green		N.C	$-V_{LED}$ n°2 (Z1)	$-V_{LED}$ n°2 (Z1)
4	Yellow		N.C	$+V_{LED}$ n°2 (Z1)	$+V_{LED}$ n°2 (Z1)
5	Grey		N.C	N.C	$-V_{LED}$ n°3 (Z3)
6	Pink		N.C	N.C	$+V_{LED}$ n°3 (Z3)
7	Blue		-TH Thermistor	-TH Thermistor	-TH Thermistor
8	Red		+TH Thermistor	+TH Thermistor	+TH Thermistor

LED arrangement			
LX1	***MX1***	***MX2***	***MX3***
			

Electrical diagram for each channel



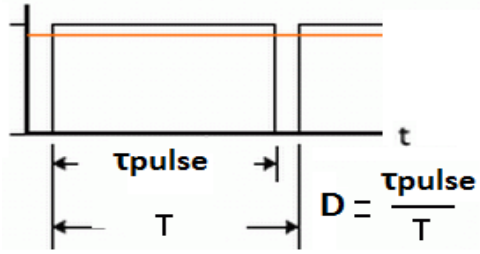
Protective diode ***D*** TVS 400mW 24V: PTVS24VS1UR

Thermistor NTC 10kΩ ***TH1***: VISHAY NTCS0805E3103JMT

Strobe mode

EFFILUX proposes a LED controller (EFFI-IPSC4) which allows you to obtain by software interface the ON time and OFF time that you desire. You can see below 5 possible configurations depending on the current that you provide to the EFFI-LASE-CPT.
Contact EFFILUX for more information.

Configuration	Current	Max pulse duration (µs) / τ_{pulse}	D
1	1.2A	50000	0.5
2	1.5A	10000	0.1
3	2A	1000	0.01
4	2.5A	100	0.001
5	3.5A	40	0.0004



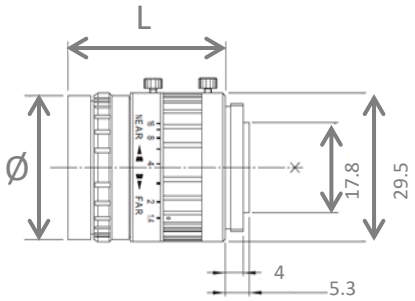
Optical considerations

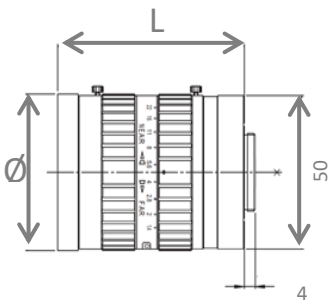
Any C-mount objective can be mounted on the EFFI-LASE-CPT. The objective is not provided with the EFFI-LASE-CPT.

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.

Objective selection

EFFILUX recommends using one of the following objectives with the EFFI-LASE-V2 (2/3" 1.5MP and 1" 1.5MP):

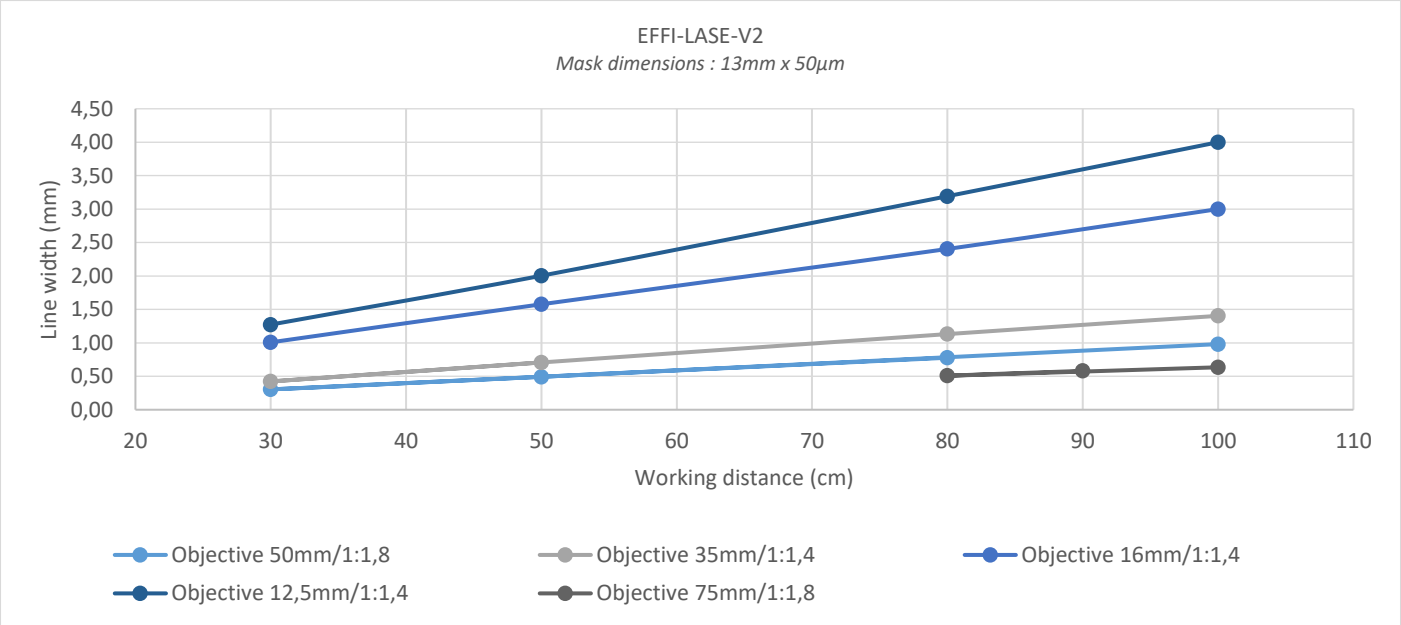
	OBJ-2-3-F9 HF9HA-1B	**OBJ-2-3-F12.5 HF12.5HA-1B**	**OBJ-2-3-F16 HF16HA-1B**	**OBJ-2-3-F25 HF25HA-1B**	**OBJ-2-3-F35 HF35HA-1B**	**OBJ-2-3-F50 HF50HA-1B**	**OBJ-2-3-F75 HF75HA-1B**
Focal length (mm)	9	12.5	16	25	35	50	75
Iris Range	F1.4 – F16				F1.6 – F22	F2.3 – F22	F2.8 – F22
Angle of View (HxV)	52°06' x 40°16'	38°47' x 29°35'	30°45' x 23° 18'	19° 58' x 15° 02'	14° 20' x 10° 46'	10° 03' x 07° 33'	6° 43' x 5° 02'
Filter thread	M27 x 0.5 mm	M25.5 x 0.5 mm					M30.5 x 0.5 mm
L x Ø	35 x 29.5 mm	29.5 x 29.5 mm	29.5 x 29.5 mm	29.5 x 29.5 mm	29.5 x 29.5 mm	29.5 x 29.5 mm	48 x 29.5 mm
Mechanical characteristics							

	OBJ-1-F12.5 CF12.5HA-1	**OBJ-1-F16 CF16HA-1**	**OBJ-1-F25 CF25HA-1**	**OBJ-1-F35 CF35HA-1**	**OBJ-1-F50 CF50HA-1**	**OBJ-1-F75 CF75HA-1**
Focal length (mm)	12.5	16	25	35	50	75
Iris Range	F1.4 – F22				F1.8 – F22	
Angle of View (HxV)	45° 13' x 42° 01'	43° 36' x 33° 24'	28° 43' x 21° 44'	20° 43' x 15° 37'	14° 35' 10° 58'	9° 45' x 7° 19'
Filter thread	M49 x 0.75 mm					
L x Ø	68.5 x 51 mm	70.5 x 51 mm	75.5 x 51 mm	48.5 x 51 mm	55.5 x 51 mm	76 x 51 mm
Mechanical characteristics						

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

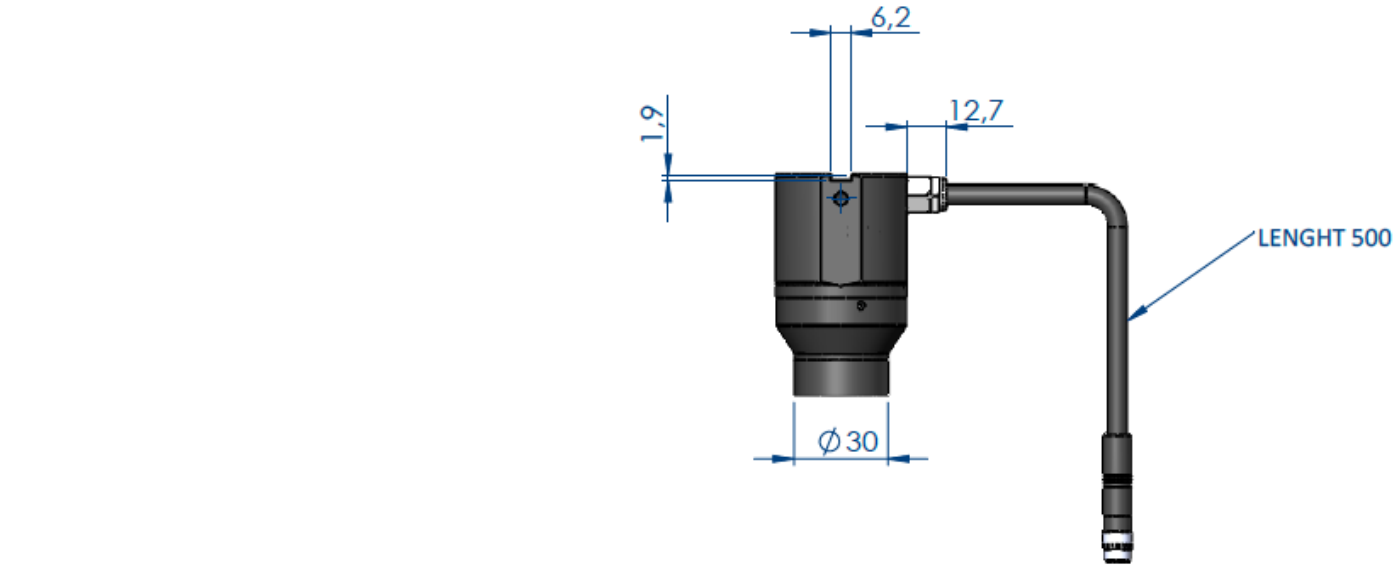
Objective	***Line width (mm)*** *Mask dimensions: 13mm x 50µm (**L01**)*			
	WD = 30cm	*WD = 50cm*	*WD = 80cm*	*WD = 100cm*
f = 12.5 mm	1.27	2	3.19	4
f = 16 mm	1.01	1.58	2.40	3
f = 35 mm	0.42	0.71	1.13	1.40
f = 50 mm	0.30	0.49	0.78	0.98
f = 75 mm	n.a	n.a	0.51	0.63

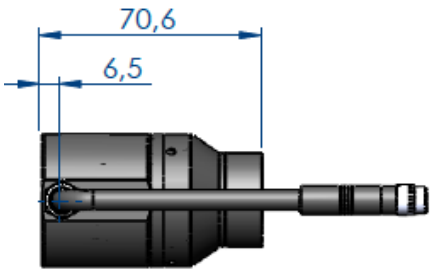
The relation between the line width and the working distance is linear. For a 50µm mask width, the following graphs are obtained**:**

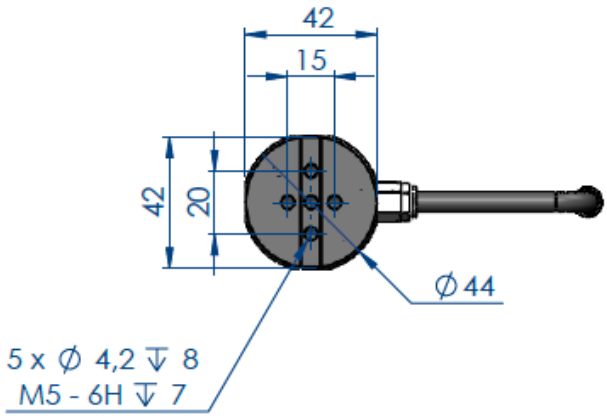


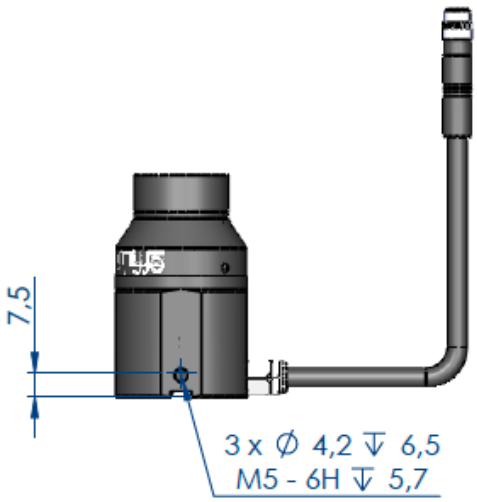
Objective	***Pattern dimensions HxW (cm)*** *Dimensions of a 12.8x9.6mm cloud of dots pattern (**C02**)*			
	WD = 30cm	*WD = 50cm*	*WD = 80cm*	*WD = 100cm*
f = 12.5 mm	32 x 23	51 x 37	82 x 59	102 x 73
f = 16 mm	25 x 19	41 x 31	66 x 49	82 x 61
f = 35 mm	11 x 8	18 x 14	29 x 22	36 x 27
f = 50 mm	n.a	12 x 9	20 x 15	25 X 19
f = 75 mm	n.a	n.a	13 x 10	16 x 12

Mechanical considerations (Dimensions in mm)



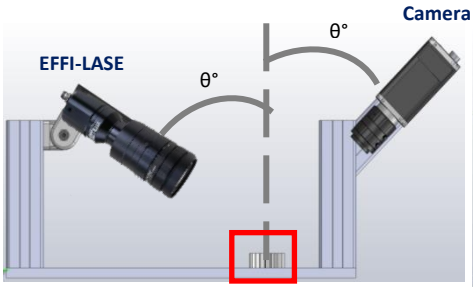




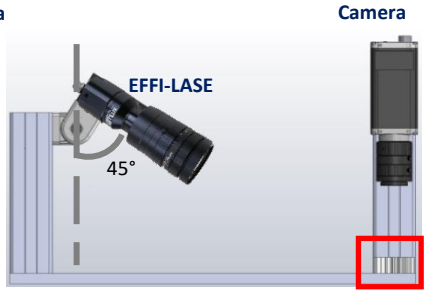


Configurations

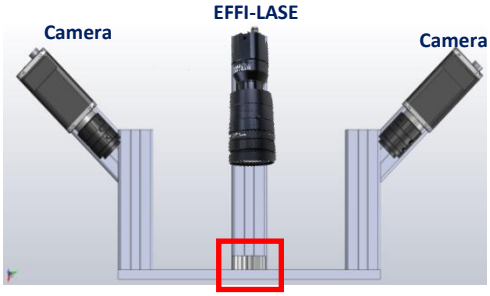
Three examples of recommended configurations:



Configuration 1



Configuration 2



Configuration 3

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.

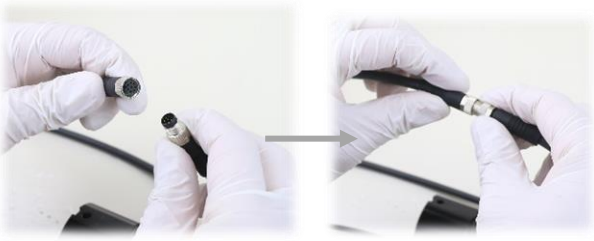
Use the fixings that you can see on the mechanical considerations to place and fix the EFFI-LASE-CPT correctly and efficiently.

<u>N.B:</u> Keep in mind that, all the pictures below (page 10/11/12) are with the PASSIVE Version but it will work for the COMPACT Version. The way to change the mask or the way to align correctly the mask are the same for both versions.

Quick Start

1 Ready

2 Screw the objective



3 Plug the M8 connector*

1	+V1
2	GND1
3	+V2
4	GND2
5	+V3
6	GND3
7	NC
8	NC

4 Turn ON and use the product

*You can plug the M8 directly to your own power supply or to the EFFILUX over molded drivers.

⚠ Direct current

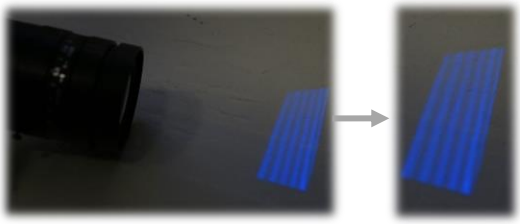
Alignment between LED and the Mask

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!*

Allen key:
Hex size (mm): 1.5

1 Ready (with Allen key*)

*The Allen key will allow you to unscrew the optical head to adjust it correctly.



The objective needs to be **defocused**. Remember, we are supposed to have one line. (mask L03)

2 Wrong alignment

When defocused

Go to step 7 (mask aligned)

Go to step 4 (mask to align)

3 Checking light form

Use the Allen key for unscrewing the **2 screws**, hex size (mm): 1.5

4 Unscrew the optical head

Turn the optical head

One line is the right form (mask form) to have when it is **defocused**!

5 Obtain the right form

You are supposed to have a good alignment, so you can fix the optical head by screwing the **2 screws** (Hex size: 1,5 mm).

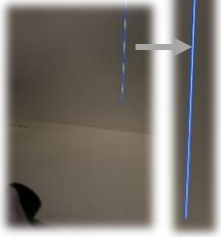
6 Screw the optical head

The light form is maintained whatever the objective focus.

But if the light form is changing you need to **go back to step 4**.

7 Checking alignment

Now you can adjust the focus for the clearness of the light form.



The EFFI-LASE is now ready to be used efficiently!

8 Good alignment

Change the mask

Before trying to change the mask, please **disconnect** the product and **unscrew** the C-mount objective. Then, you can follow the steps below. It is recommended to use **gloves**.

Allen Key Mask EFFM-SPANNER-WRENCH

The three items are needed for the following steps.

1 Ready

Allen Key

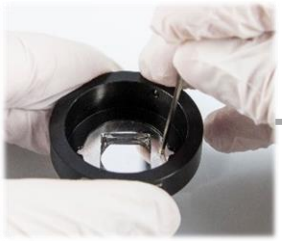
2 Unscrew the optical head

C-mount EFFM-SPANNER-WRENCH Ring

3 Unscrew the C-mount & ring

There is a cover in front of the mask that you have to remove from behind.

No need to unscrew.

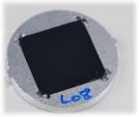


Mask

Cover

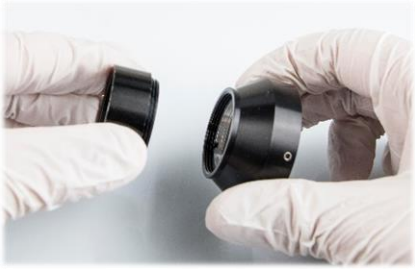
4 Remove the mask carefully

You must see the reference of the mask (L08, L03…) when you place it into the optical head.



5 Place the new mask (L03)

6 Place the cover & Ring



7 Place and screw the C-mount

The EFFI-LASE is ready to be used with the new mask!
Please refer to the step alignment with the mask if needed.

8 Screw the optical head

Remember that the “Change the mask” part works with all the EFFI-LASE Version (PSV, FAN, CPT) even if the pictures are with a CPT.

N.B: If you did not to succeed the steps for one of the three parts. Please feel free to contact us.

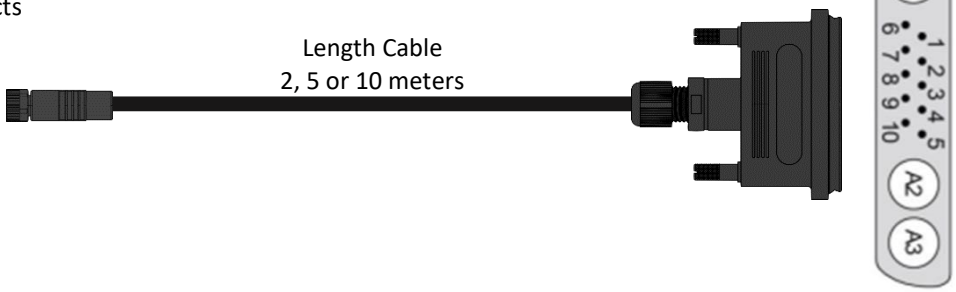
EFFI-IPSC4 accessory (to purchase separately)

EFFILUX provides an over molded SuBD-Male / M8-Female-8 PINs cable to plug the EFFI-LASE-CPT to an EFFI-IPSC4. The colors and the signals are corresponding with the array for the M8 connector above (page 3)

INPUT Connector :
SuBD Male

OUTPUT Connector :
M8 Female 8 contacts

Length Cable
2, 5 or 10 meters



SUBD / M8 CONNECTOR 8 CONTACTS								
Cable color	**SUBD Contact arrangement (Male)**		**Designation**	**M8 Contact arrangement (Female)**		**With MX1 / LX1**	**With MX2**	**With MX3**
White		1	GND Channel 1		1	-V_{LED}	-V_{LED} n°1 (Z2)	-V_{LED} n°1 (Z2)
Brown		A3	+Vcommon		2	+V_{LED}	+V_{LED} n°1 (Z2)	+V_{LED} n°1 (Z2)
Green		2	GND Channel 2		3	n.c.	-V_{LED} n°2 (Z1)	-V_{LED} n°2 (Z1)
Yellow		A3	+Vcommon		4	n.c.	+V_{LED} n°2 (Z1)	+V_{LED} n°2 (Z1)
Grey		3	GND Channel 3		5	n.c.	n.c.	-V_{LED} n°3 (Z3)
Pink		A3	+Vcommon		6	n.c.	n.c.	+V_{LED} n°3 (Z3)
Blue		n.c.	n.c.		7	-TH Thermistor	-TH Thermistor	-TH Thermistor
Red		n.c.	n.c.		8	+TH Thermistor	+TH Thermistor	+TH Thermistor

EFFILUX provides cables to integrate the EFFI-LASE + EFFI-IPSC4 into your process.

Cables (other length on request)	**EFFI-IPSC4**
2 meters: EFFC-CAB-M8-SUBD-FM-8-DD-L2	 Strobe controller with **4 Channels** Up to **10A per channel** (in pulse mode) Pulse width from **1µs to continuous** mode
5 meters: EFFC-CAB-M8-SUBD-FM-8-DD-L5	
10 meters: EFFC-CAB-M8-SUBD-FM-8-DD-L10	