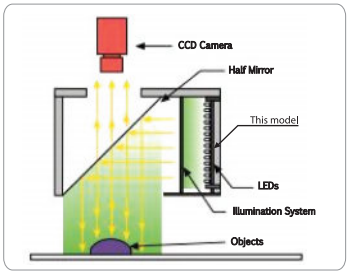
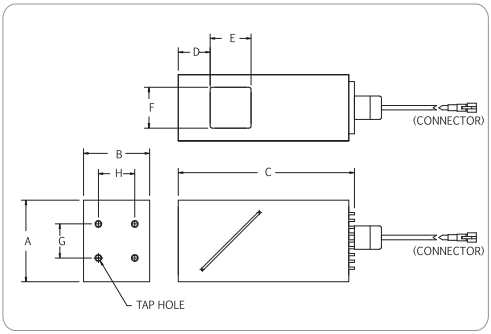
Upgrade Product

CAS2 SERIES- Even Co-axial Light

CAS2 series provide co-axial illumination for tele-centric lenses. The lights are reflected by 45 degrees half mirror to provide light in line with the camera.

Application: surface inspection and alignment, wafer, metal surface, film, LCD and glass, pattern on PCB.





Technical Specification:
- Color Red, Green, Blue and White
- 24V DC Input Power
- Continuous and Strobe Applications
- Compact Size
- Lighting Cable 500mm

Customize Lighting:
- Customize Sizes, Mounting requirements
- Color and Voltage Available
- Consult Technical Sales for More Information

Model	Dimensions (MM)									Color	Voltage / Watt	Current
	A	B	C	D	E	F	G	H	TAP HOLE			
CAS2-00-010-X-X	36	29	77.4	14	18	18	15	16	M3	●	24V/1.80W	75mA
										● ● ○	24V/3.12W	130mA
CAS2-00-020-X-X	46	39	87.3	15.5	25	24	20	20	M4	●	24V/1.92W	80mA
										● ● ○	24V/3.60W	150mA
New CAS2-00-025-X-X	33	33	54	8	25	25.6	16	15	M3	●	24V/3.60W	150mA
										● ● ○	24V/3.84W	160mA
CAS2-00-040-X-X	66	60	107.5	14	48	48	25	25	M5	●	24V/3.50W	146mA
										● ● ○	24V/8.40W	350mA
CAS2-00-070-X-X	95	89	139.6	21.2	70	70	50	50	M5	●	24V/12.60W	525mA
										● ● ○	24V/13.44W	560mA
CAS2-00-080-X-X	81	104	125.5	12.2	65	84	45	50	M5	●	24V/10.80W	450mA
										● ● ○	24V/10.94W	456mA
CAS2-00-100-X-X	123.8	120	168.7	18.2	100	100	50	50	M5	●	24V/10.80W	450mA
										● ● ○	24V/18.74W	781mA

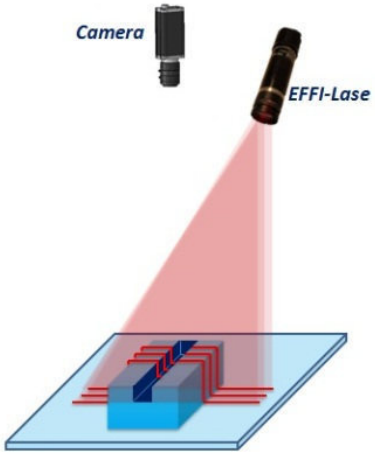
Remarks : 1. CAS part numbers changed to CAS2
2. Add new model CAS2-00-025-X
3. The current of CAS2 is changed.

LED Pattern projector

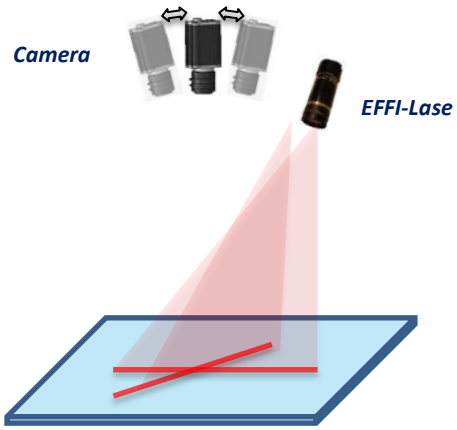
EFFI-Lase

- **Sharp edges** for accurate measurements
- **Homogeneity**
- **Standard** connections and fasteners
- No speckle
- **Flexible:**
  - Any **C-mount objective**
  - **Large range of patterns**
  - Full range of colors**: from UV to IR, white**
- **Long lifetime** and few maintenance

APPLICATIONS:



Stereo Vision and 3D profiling



Alignment applications

OVERVIEW OF THE CHARACTERISTICS

Electronics	*Power supply*	24V DC or constant current
	Illumination mode	Continuous or strobe modes
	Connectors	M12 4 pins or M8 3 pins
	Power consumption	5W
Optics	*Wavelength*	Various wavelengths (from UV to IR, white)
	Projection system	Any C-mount objective
	Projected pattern	Various designs for alignment, 3D profiling and stereovision
Mechanics	*Maximum dimensions*	32mm x 105mm (without the objective)
	Objective adjustment	A C-mount adaptor on the projector
	Fastener	4 M4 holes on the side of the device
	Material	Device body : Aluminum alloy
Environment	*Working temperature*	0°C to 50°C
	IP code	IP54

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TECHNICAL CHARACTERISTICS

How to create the EFFI-Lase?

EFFI-Lase_CM_XXX_XXX

Pattern

Wavelength (nm)

Available wavelengths:

- White: ***000***
- Far UV: ***365***
- Near UV: ***405***
- Blue: ***465***
- Green: ***525***
- Red: ***625***
- Far Infrared: ***850***

Other wavelengths are available upon request

Available options:

- Add a 'P' to integrate a polarizer
- Add a 'S' to strobe the device

Example: EFFI-Lase_CM_L03_625_P_S

3D profiling		
	L01	Single line pattern 50µm
	L02	Single line pattern 20µm
	L03	Single line pattern 10µm
	L04	3 lines pattern 500µm pitch
	L05	3 lines pattern 200µm pitch
	L06	5 lines pattern
	L07	100 lines pattern
	L08	20 lines pattern
	L09	Single line pattern 5µm

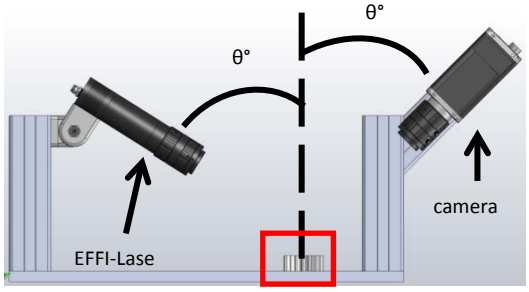
Stereovision		
	C02	Cloud of dots - density 50%
	C03	Cloud of dots 1 - density 17%
	C04	Cloud of dots 2 - density 17%
	G01	Grid with rounded points - small
	G02	Grid with rounded points - large
	G03	Grid with lines - small
	G04	Grid with lines - large
	G05	Grid with squares

Alignment		
	A01	Cross pattern
	A02	Concentric circles
	A03	4 lines arranged in a square

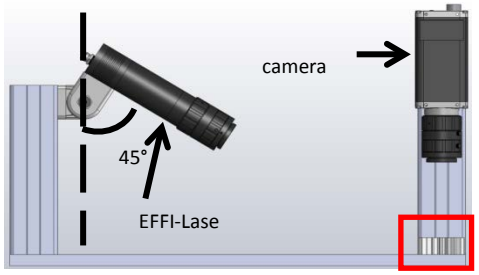
Specific patterns are available upon request

Pattern projection description

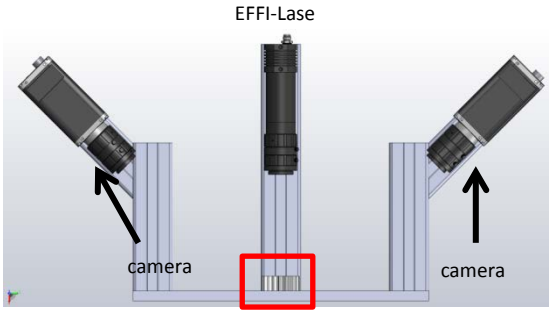
Three examples of recommended configurations:



Configuration 1



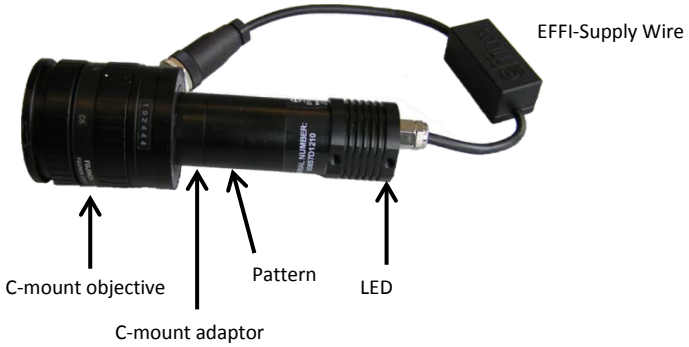
Configuration 2



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.

Pattern projector description



Any C-mount objective can be mounted on the EFFI-Lase.

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 contact with the mask: this one is sensitive and can easily be damaged.

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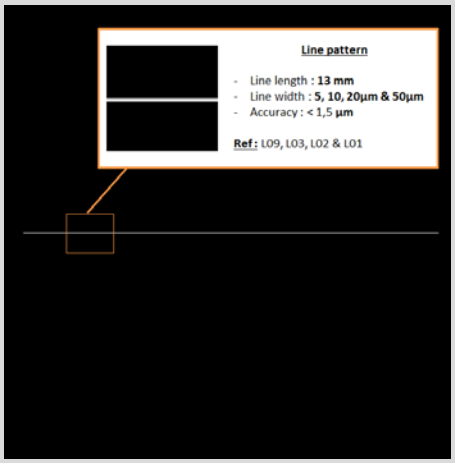
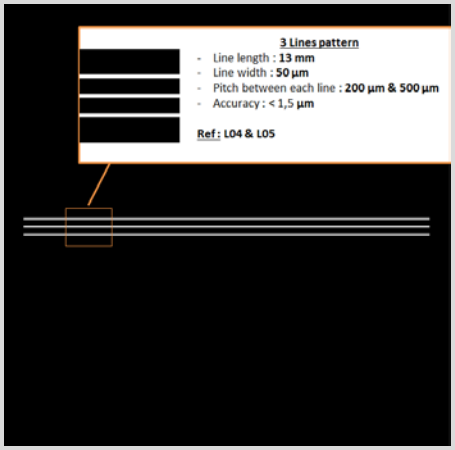
Efficient Led Lighting

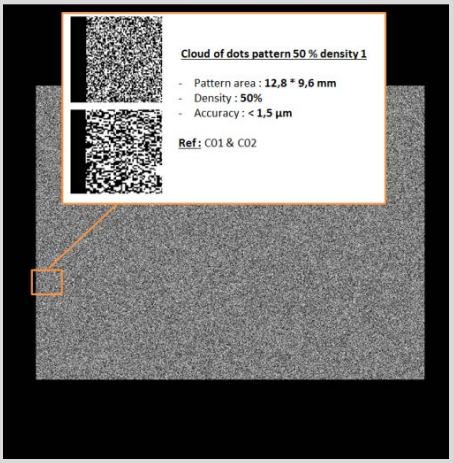
Masks presentation

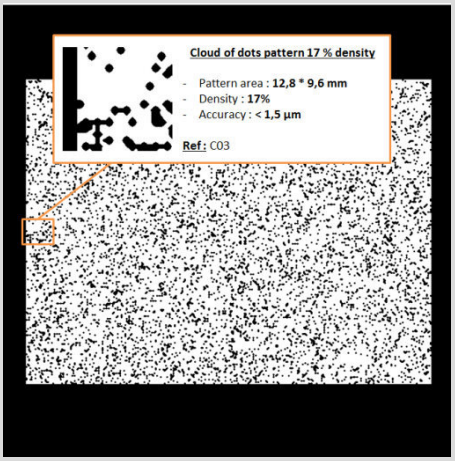
3D Profiling

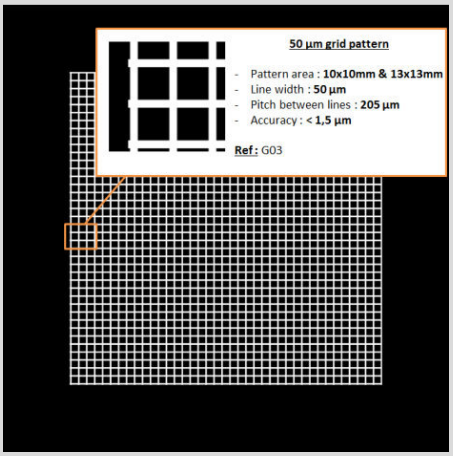


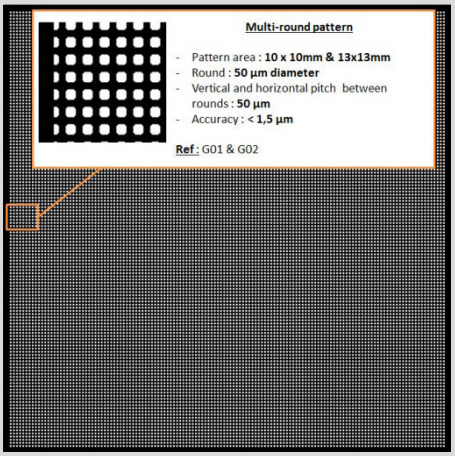


Stereovision application

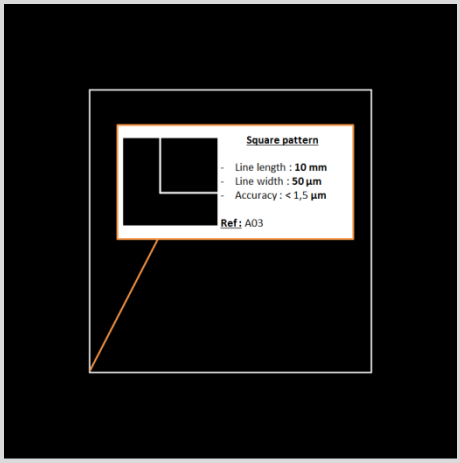








Alignment



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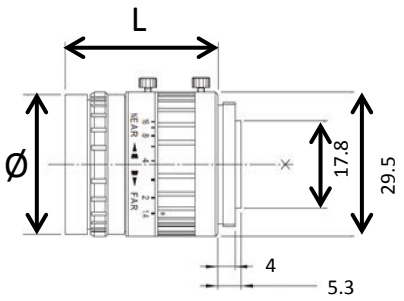
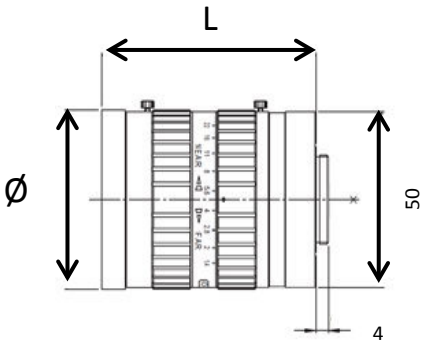
Objective selection

EFFILUX recommends using one the following objectives with the EFFI-Lase.



	EFFO-Objective_0001 HF9HA-1B	EFFO-Objective_0002 HF12.5HA-1B	EFFO-Objective_0003 HF25HA-1B	EFFO-Objective_0004 HF50HA-1B
Focal Length (mm)	9	12.5	25	50
Iris Range	F1.4 – F16			F2.3 – F22
Angle of view (HxV)	52°06' x 40°16'	38°47' x 29°35'	19°58' x 15°02'	10°03' x 7°33'
Filter thread	M27x0.5	M25.5x0.5	M25.5x0.5	M25.5x0.5
L x Ø (mm)	35 x 28.5 mm	29.5 x 26.5 mm	29.5x26.5 mm	29.5x26.5 mm

A high resolution objective is recommended for large patterns, such as the cloud of dots.



	EFFO-Objective_0007 HF12.5SA-1	EFFO-Objective_0008 HF25SA-1	EFFO-Objective_0009 HF50SA-1	EFFO-Objective_0010 HF75SA-1
Focal Length (mm)	12.5	25	50	75
Iris Range	F1.4 – F22		F1.8 – F22	
Angle of view (HxV)	38°47' x 29°35'	19°58' x 15°02'	10°03' x 7°33'	6°43' x 5°02'
Filter thread	M49x0.75	M49x0.75	M49x0.75	M49x0.75
L x Ø (mm)	68.5 x 51 mm	75.5 x 51 mm	55.5x51 mm	76x51 mm

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

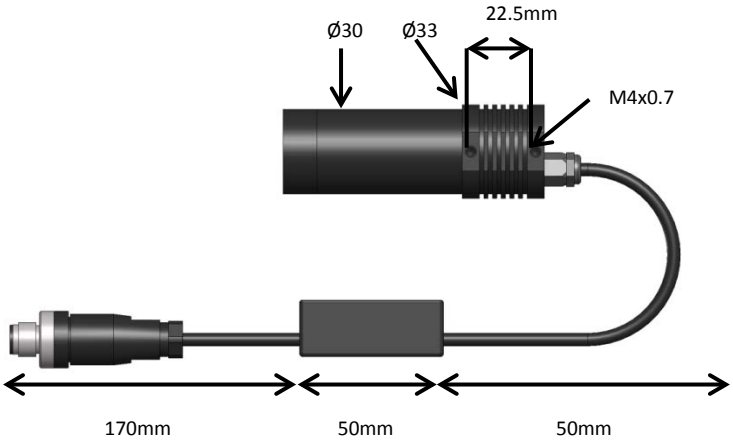
Objective	*Line length (mm)*				
	WD = 20mm	*WD = 50mm*	*WD = 100mm*	*WD = 200mm*	*WD = 300mm*
f=9mm	55	100	170	300	450
f=12.5mm	50	75	130	230	340
f=25mm	15	40	60	120	180
f=50mm	n.a.	n.a.	15	45	75

Dimensions of a 50µm line pattern

Objective	***Pattern dimensions H x W (mm)***		
	WD = 200mm	*WD = 500mm*	*WD = 1000mm*
f=25mm	100 x 76	250 x 188	500 x 380
f=50mm	-	125 x 94	250 x 190

Dimensions of a 12.8x9.6mm cloud of dots pattern

Mechanical considerations



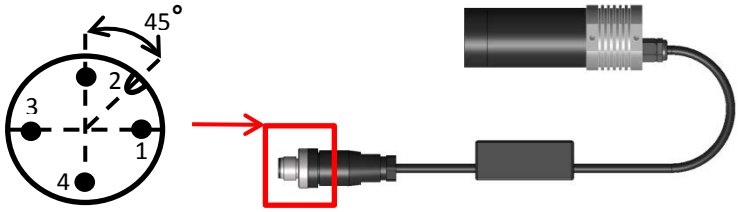
Four M4x0.7 holes can be used to fasten the device in the set up.

Electrical characteristics

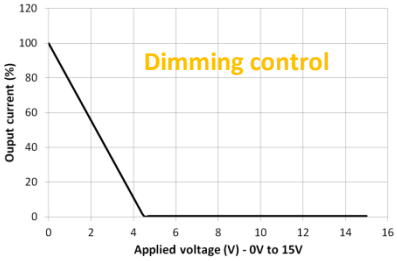
Standard connection

The EFFI-Lase is supplied using the EFFI-Supply Wire (bolted on the projector) and a 24V constant voltage.

Pin number	*Cable color*	*Designation*
1	Brown	+24V
2	White	n.a.
3	Blue	GND
4	Black	DIM – *max 15V*



M12 connector



Make sure that you never exceed the maximum voltage.

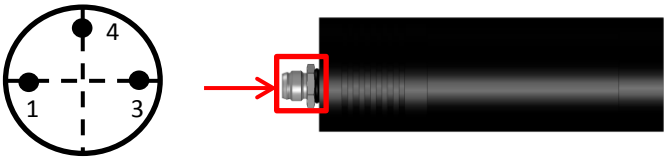
The device is supplied with a 24V (±5%) constant voltage source.

Connection with a current source

A current source, with the correct settings and the correct wires, can be used to supply EFFI-Lase in a pulsed mode: contact EFFILUX technical support for complete details.

Be aware that the current source option cannot be used with the EFFI-Supply Wire but needs a specific M8 connector.

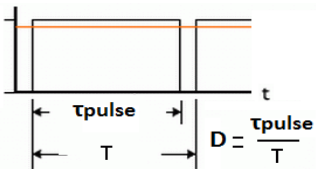
Pin number	*Cable color*	*Designation*
1	Brown	n.a.
3	Blue	+
4	Black	GND



M8 connector

The projector, supplied with a 700mA constant current is considered as the reference. The frequency of the cycle (ON & OFF) has been fixed to 10Hz.

The maximal duty cycle, D, dependent on the injected current, required to safely pulse the LED projector is defined by:



$$D = \frac{\tau_{pulse}}{T}$$

Be aware that the maximum duty cycle for a given current, given in the following table, cannot be exceeded.

Configuration	*Current*	*Max pulse duration (µs)*	*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

$$G_{max} = \frac{luminous\ flux\ (I_{max})}{luminous\ flux\ (I_{700mA})}$$

G_{max}	*400nm*	*460nm*	*525nm*	*590nm*	*625nm*	*850nm*	*White*
Configuration 1	1,5	1,4	1,4	1,5	1,6	1,5	1,4
Configuration 2	2	1,8	1,7	2,1	2	1,8	1,7
Configuration 3	2,6	2,2	2,1	2,7	2,6	2,4	2
Configuration 4	3,2	2,6	2,3	3,4	3,2	2,9	2,4
Configuration 5	4	3,1	2,9	4	4,4	3,6	2,8

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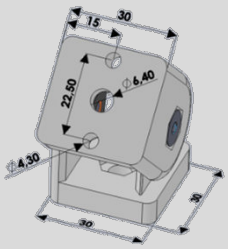
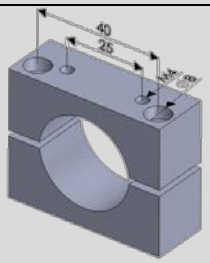
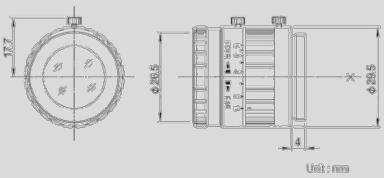
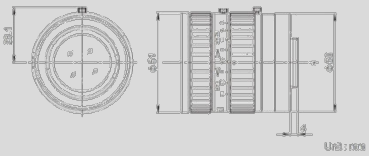
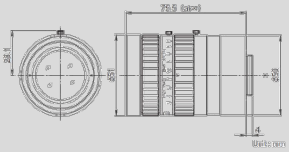
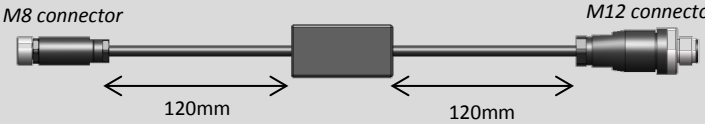
ACCESSORIES

	EFFILUX reference	Description	
Mechanics	EFFM_1_0009		Fastener used to simplify the projector integration (orientation) *Delivered with 2 M4x12 screws, 1 M6x14 screws and 1 EFFV-Bolt_0011*
	EFFM_1_0001		Fastener used to simplify the projector integration *Delivered with 2 M4x20 screws*
Optics	EFFO-Polariser_0004	Polarizer integrated in the projector to polarize the output light	
	EFFO-Objective_0001 EFFO-Objective_0002 EFFO-Objective_0003 EFFO-Objective_0004 EFFO-Objective_0005		HF9HA-1B – f=9m, 2/3” HF12.5HA-1B – f=12.5mm, 2/3” HF25HA-1B – f=25mm, 2/3” HF50HA-1B – f=50mm, 2/3” HF75HA-1B – f=75mm, 2/3”
	EFFO-Objective_0006 EFFO-Objective_0007 EFFO-Objective_0008 EFFO-Objective_0009 EFFO-Objective_0010	*High resolution objective* 	HF9SA-1 – f=9mm, 2/3" HF12.5SA-1 – f=12.5mm, 2/3" HF25SA-1 – f=25mm, 2/3" HF50SA-1 – f=50mm, 2/3" HF75SA-1 – f=75mm, 2/3”
	EFFO-Objective_0011 EFFO-Objective_0012 EFFO-Objective_0013 EFFO-Objective_0014		CF12.5HA-1 – f=12.5mm, 1" CF16HA-1 – f=16mm, 1" CF25HA-1 – f=25mm, 1" CF50HA-1 – f=50mm, 1"
Electronics	EFFC-Cable_M12_0002 Binder: *79 3430 13 04*	M12 cable, 4 pins, 2000mm long	
	EFFC-Cable_M12_0003 Binder: *79 3430 17 04*	M12 cable, 4 pins, 5000mm long	
	EFFC-Cable_M12_0004 Binder: *79 3430 30 04*	M12 cable, 4 pins, 10000mm long	
	EFFC-Cable_M12_0025 *Phoenix : 1456938*	M12 cable, 4 pins, High-Flex, 1500mm long	
	EFFC-Cable_M12_0025 *Phoenix : 1456941*	M12 cable, 4 pins, High-Flex, 3000mm long	
	EFFE-Comp_0006	 LED driver to use in the strobe configuration	

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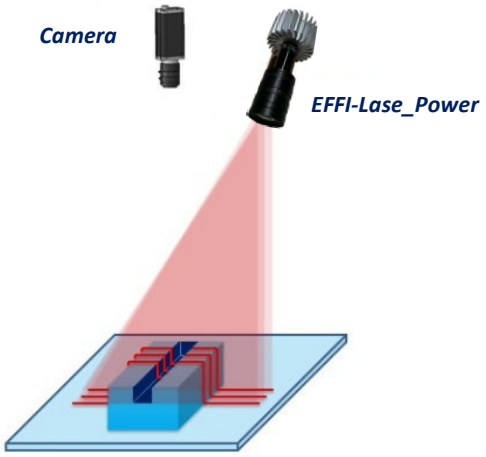
LED Pattern projector

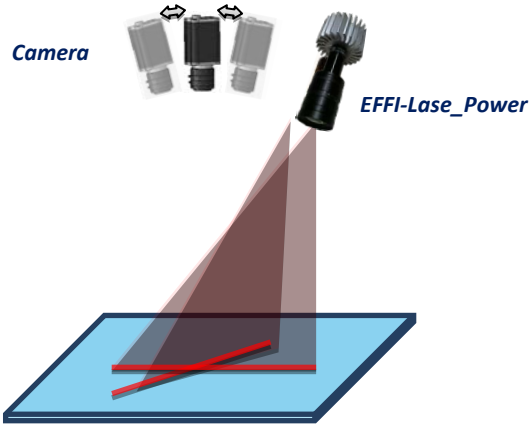
EFFI-Lase Power

- **Sharp edges** for accurate measurements
- **Homogeneity**
- **Standard** connections and fasteners
- No speckle
- **Flexible:**
  - Any **C-mount objective**
  - **Large range of patterns**
  - Full range of colors**: from UV to IR, white**
- **Long lifetime** and few maintenance

APPLICATIONS:



Stereo Vision and 3D profiling



Alignment applications

OVERVIEW OF THE CHARACTERISTICS

Electronics	*Power supply*	24V DC or constant current
	Illumination mode	Continuous or strobe modes
	Connectors	M12 4 pins or M8 3pins
	Power consumption	15W
Optics	*Wavelength*	Various wavelengths (from UV to IR)
	Projection system	Any C-mount objective
	Projected pattern	Various designs for alignment, 3D profiling and stereovision
Mechanics	*Maximum dimensions*	85 mm x 125 mm (without the objective)
	Objective adjustment	A C-mount adaptor on the projector
	Fastener	2 M4 holes and 1 M6 hole on the backside of the device
	Material	Device body : Aluminum alloy
Environment	*Working temperature*	0°C to 50°C
	IP code	IP54

TECHNICAL CHARACTERISTICS

How to create the EFFI-Lase Power?

EFFI-Lase_Power_CM_XXX_XXX

Pattern

Wavelength (nm)

Available wavelengths:

- White: ***000***
- Far UV: ***365***
- Near UV: ***405***
- Blue: ***465***
- Green: ***525***
- Red: ***625***
- Far Infrared: ***850***

Other wavelengths are available upon request

Available options:

- Add a 'P' to integrate a polarizer
- Add a 'S' to strobe the device

Example: EFFI-Lase_Power_CM_L03_625_P_S

3D profiling		
	L01	Single line pattern 50µm
	L02	Single line pattern 20µm
	L03	Single line pattern 10µm
	L04	3 lines pattern 500µm pitch
	L05	3 lines pattern 200µm pitch
	L06	5 lines pattern
	L07	100 lines pattern
	L08	20 lines pattern
	L09	Single line pattern 5µm

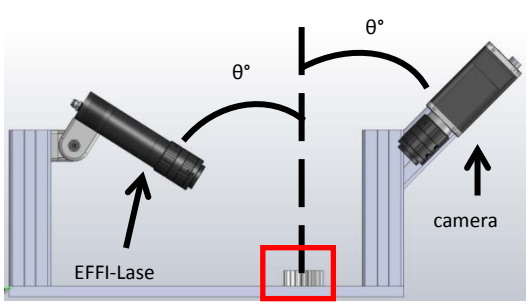
Stereovision		
	C02	Cloud of dots - density 50%
	C03	Cloud of dots 1 - density 17%
	C04	Cloud of dots 2 - density 17%
	G01	Grid with rounded points - small
	G02	Grid with rounded points - large
	G03	Grid with lines - small
	G04	Grid with lines - large
	G05	Grid with squares

Alignment		
	A01	Cross pattern
	A02	Concentric circles
	A03	4 lines arranged in a square

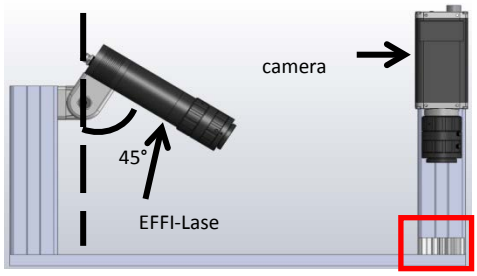
Specific patterns are available upon request

Pattern projection description

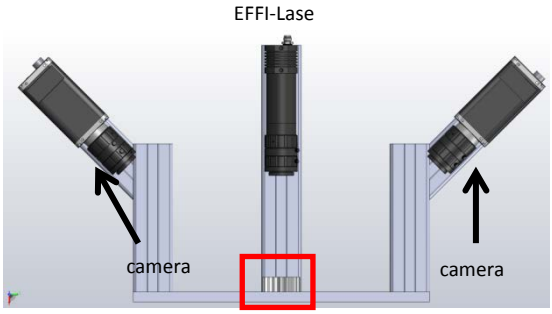
Three examples of the recommended configurations:



Configuration 1



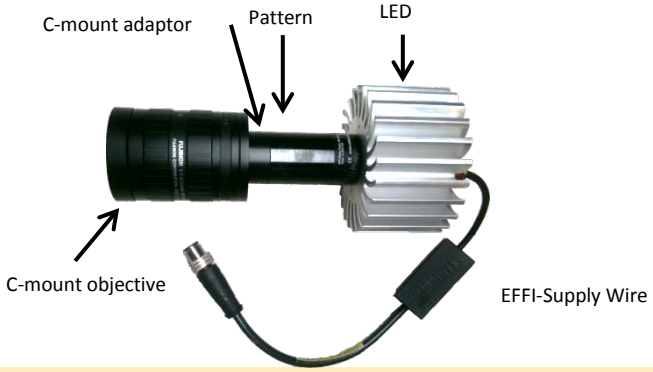
Configuration 2



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.

Pattern projector description



Any C-mount objective can be mounted on the EFFI-Lase Power.

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 contact with the mask: this one is sensitive and can easily be damaged.

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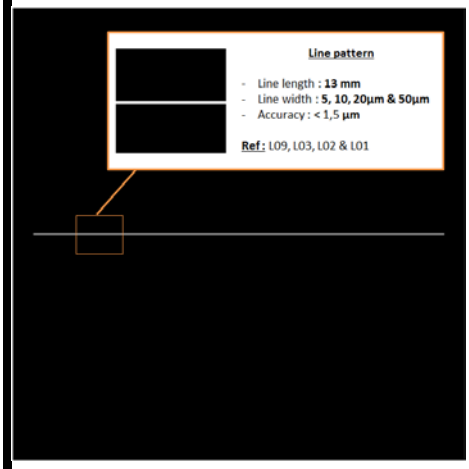
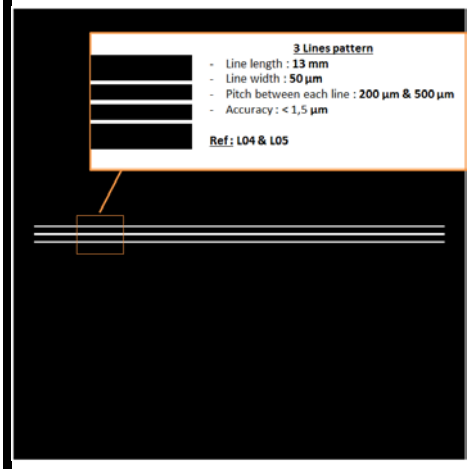
Efficient Led Lighting

CE RoHS

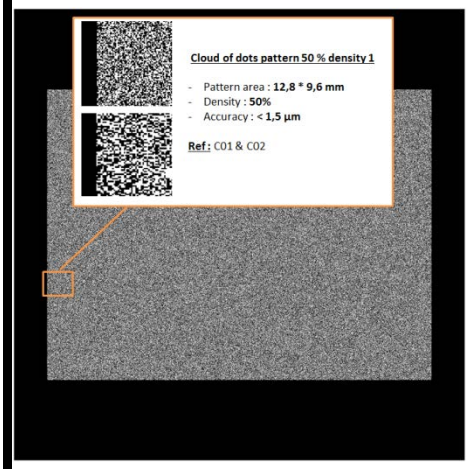
Masks presentation

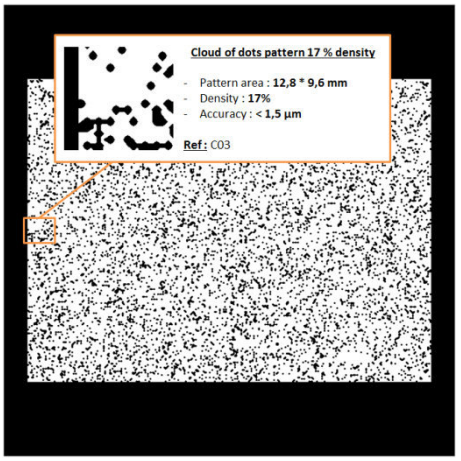
3D Profiling

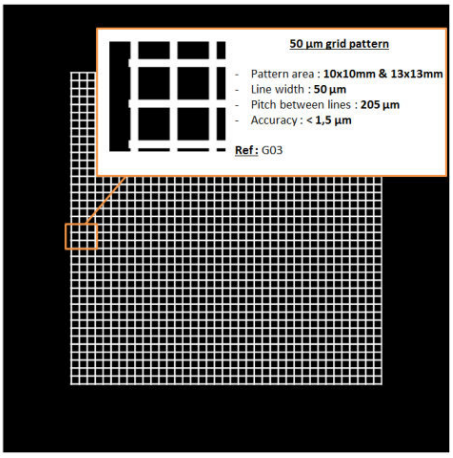


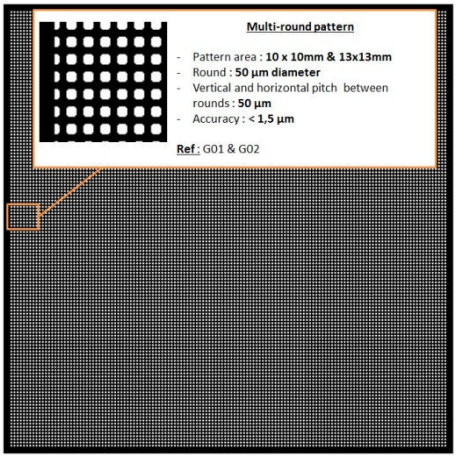


Stereovision application

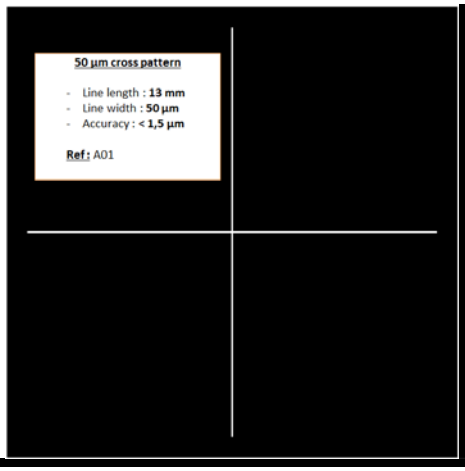


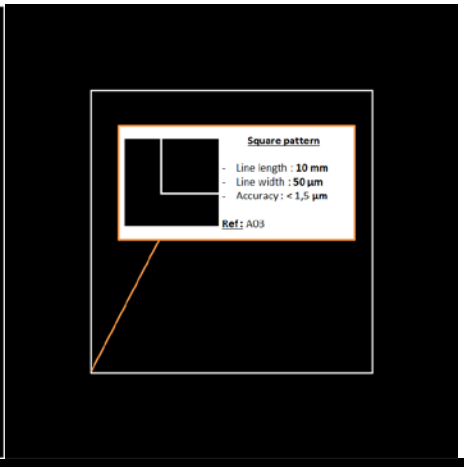






Alignment





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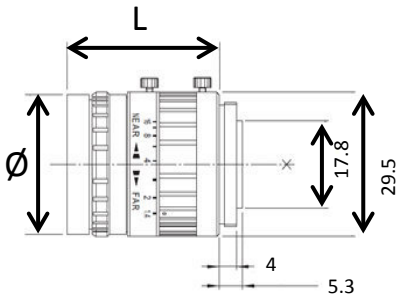
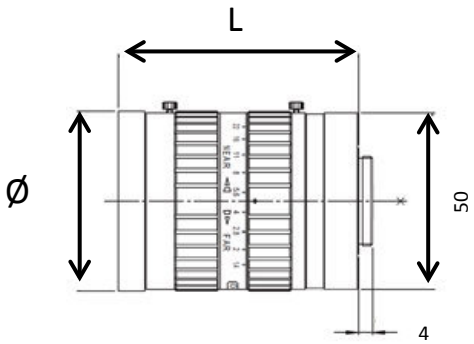
Objective selection

EFFILUX recommends using one the following objectives with the EFFI-Lase Power.



	HF9HA-1B	HF12.5HA-1B	HF25HA-1B	HF50HA-1B
Focal Length (mm)	9	12.5	25	50
Iris Range	F1.4 – F16			F2.3 – F22
Angle of view (HxV)	52°06' x 40°16'	38°47' x 29°35'	19°58' x 15°02'	10°03' x 7°33'
Filter thread	M27x0.5	M25.5x0.5	M25.5x0.5	M25.5x0.5
L x Ø (mm)	35 x 28.5 mm	29.5 x 26.5 mm	29.5x26.5 mm	29.5x26.5 mm

A high resolution objective is recommended for large patterns, such as the cloud of dots.



	HF12.5SA-1	HF25SA-1	HF50SA-1	HF75SA-1
Focal Length (mm)	12.5	25	50	75
Iris Range	F1.4 – F22		F1.8 – F22	
Angle of view (HxV)	38°47' x 29°35'	19°58' x 15°02'	10°03' x 7°33'	6°43' x 5°02'
Filter thread	M49x0.75	M49x0.75	M49x0.75	M49x0.75
L x Ø (mm)	68.5 x 51 mm	75.5 x 51 mm	55.5x51 mm	76x51 mm

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

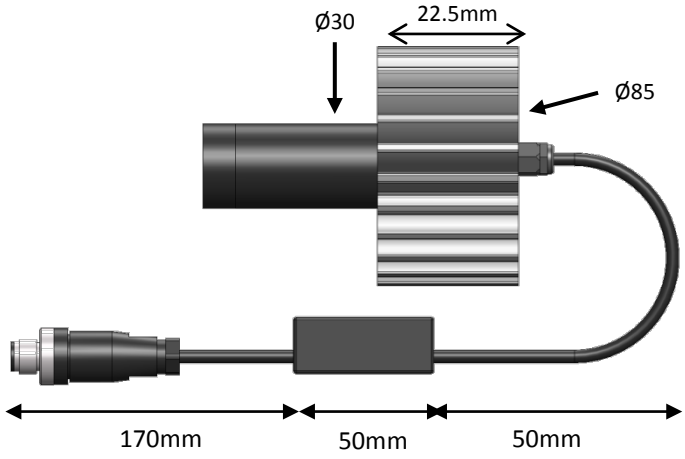
Objective	***Line length (mm)***				
	WD = 20mm	*WD = 50mm*	*WD = 100mm*	*WD = 200mm*	*WD = 300mm*
f=9mm	55	100	170	300	450
f=12.5mm	50	75	130	230	340
f=25mm	15	40	60	120	180
f=50mm	n.a.	n.a.	15	45	75

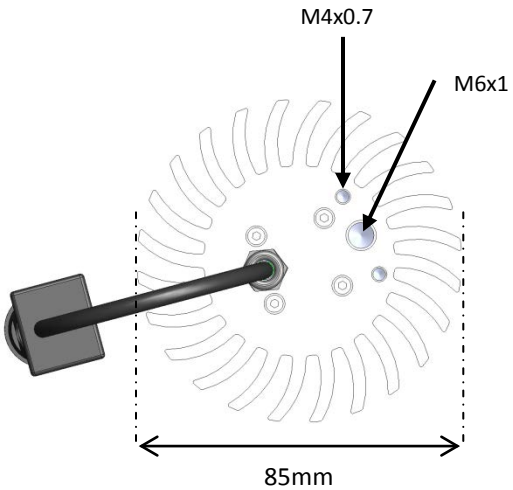
Dimensions of a 50µm line pattern

Objective	***Pattern dimensions H x W (mm)***		
	WD = 200mm	*WD = 500mm*	*WD = 1000mm*
f=25mm	100 x 76	250 x 188	500 x 380
f=50mm	-	125 x 94	250 x 190

Dimensions of a 12.8x9.6mm cloud of dots pattern

Mechanical considerations





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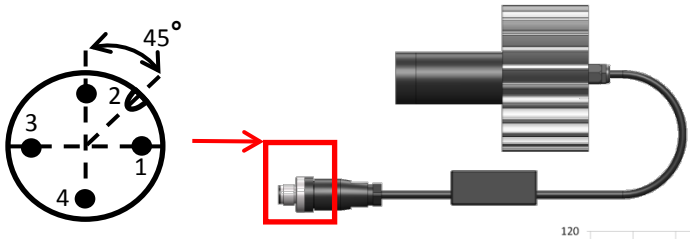
Electrical characteristics

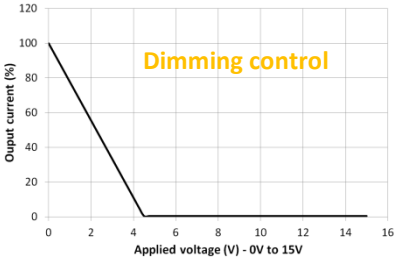
Standard connection

The EFFI-Lase Power is supplied using the EFFI-Supply Wire (delivered with the projector) and a 24V constant voltage.

Pin number	*Cable color*	*Designation*
1	Brown	+24V
2	White	n.a.
3	Blue	GND
4	Black	DIM – *max 15V*



M12 connector



Make sure that you never exceed the maximum voltage.

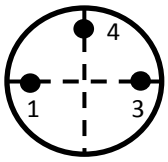
The device is supplied with a 24V (±5%) constant voltage source.

Connection with a current source

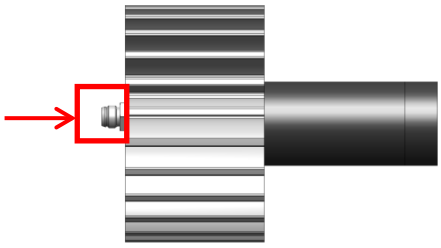
A current source, with the correct settings and the correct wires, can be used to supply EFFI-Lase Power in a pulsed mode: contact EFFILUX technical support for complete details.

Be aware that the current source option cannot be used with the EFFI-Supply Wire but needs a specific M8 connector.

Pin number	*Cable color*	*Designation*
1	Brown	n.a.
3	Blue	+
4	Black	GND

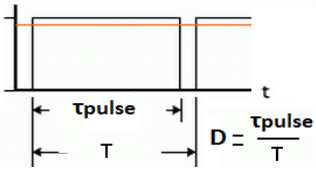


M8 connector



The projector, supplied with a 700mA constant current is considered as the reference. The frequency of the cycle (ON & OFF) has been fixed to 10Hz.

The maximal duty cycle, D, dependent on the injected current, required to safely pulse the LED projector is defined by:



$$D = \frac{\tau_{pulse}}{T}$$

Be aware that the maximum duty cycle for a given current, given in the following table, cannot be exceeded.

Configuration	*Current*	*Max pulse duration (µs)*	*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

$$G_{max} = \frac{luminous\ flux\ (I_{max})}{luminous\ flux\ (I_{700mA})}$$

G_{max}	*400nm*	*460nm*	*525nm*	*590nm*	*625nm*	*850nm*	*White*
Configuration 1	1,5	1,4	1,4	1,5	1,6	1,5	1,4
Configuration 2	2	1,8	1,7	2,1	2	1,8	1,7
Configuration 3	2,6	2,2	2,1	2,7	2,6	2,4	2
Configuration 4	3,2	2,6	2,3	3,4	3,2	2,9	2,4
Configuration 5	4	3,1	2,9	4	4,4	3,6	2,8

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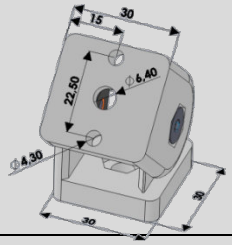
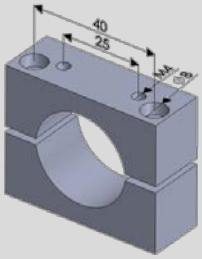
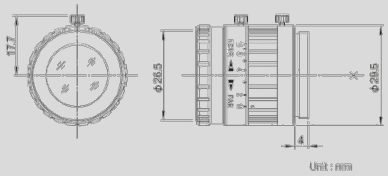
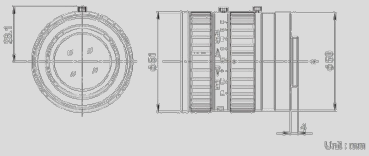
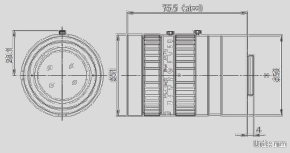
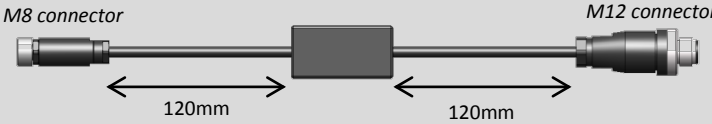
ACCESSORIES

	EFFILUX reference	Description
Mechanics	EFFM_1_0009	 Fastener used to simplify the projector integration (orientation) *Delivered with 2 M4x12 screws, 1 M6x14 screws and 1 EFFV-Bolt_0011*
	EFFM_1_0001	 Fastener used to simplify the projector integration *Delivered with 2 M4x20 screws*
Optics	EFFO-Polariser_0004	Polarizer integrated in the projector to polarize the output light
	EFFO-Objective_0001 EFFO-Objective_0002 EFFO-Objective_0003 EFFO-Objective_0004 EFFO-Objective_0005	 HF9HA-1B – f=9m, 2/3” HF12.5HA-1B – f=12.5mm, 2/3” HF25HA-1B – f=25mm, 2/3” HF50HA-1B – f=50mm, 2/3” HF75HA-1B – f=75mm, 2/3”
	EFFO-Objective_0006 EFFO-Objective_0007 EFFO-Objective_0008 EFFO-Objective_0009 EFFO-Objective_0010	*High resolution objective*  HF9SA-1 – f=9mm, 2/3" HF12.5SA-1 – f=12.5mm, 2/3" HF25SA-1 – f=25mm, 2/3" HF50SA-1 – f=50mm, 2/3" HF75SA-1 – f=75mm, 2/3”
	EFFO-Objective_0011 EFFO-Objective_0012 EFFO-Objective_0013 EFFO-Objective_0014	 CF12.5HA-1 – f=12.5mm, 1" CF16HA-1 – f=16mm, 1" CF25HA-1 – f=25mm, 1" CF50HA-1 – f=50mm, 1"
Electronics	EFFC-Cable_M12_0002 Binder: *79 3430 13 04*	M12 cable, 4 pins, 2000mm long
	EFFC-Cable_M12_0003 Binder: *79 3430 17 04*	M12 cable, 4 pins, 5000mm long
	EFFC-Cable_M12_0004 Binder: *79 3430 30 04*	M12 cable, 4 pins, 10000mm long
	EFFC-Cable_M12_0025 *Phoenix : 1456938*	M12 cable, 4 pins, High-Flex, 1500mm long
	EFFC-Cable_M12_0025 *Phoenix : 1456941*	M12 cable, 4 pins, High-Flex, 3000mm long
	EFFE-Comp_0006	*M8 connector* *M12 connector*  120mm 120mm LED driver to use in the strobe configuration