effilux

**Efficient
Led Lighting**

LED lighting systems
for machine vision

www.effilux.com

Index

Our philosophy

Our products

Our philosophy

Company about

"EFFILUX designs and manufactures innovative LED lighting for machine vision.

Innovation has been embedded in the DNA of the company since its foundation. The company differentiates itself through its control of LED lighting, its advanced optical expertise, innovative products and quality services. Even today its key differentiators enable EFFILUX to post growth of over 60% per year over the last three years.

EFFILUX offers a range of innovative and quality standard products. The research department, separated into 3 poles (electric - optical - mechanical), proposes to develop customized solutions.

EFFILUX has established trusted relationships with leading distributors of machine vision components in Europe. The company occupies the place of leader in European machine vision.

We look forward to working together,

Arnaud Mestivier & Jean Philippe Blanchot"

We pay particular interest to our team.
The complementary skills and the cohesion spirit are the strength
of EFFILUX and bring your project to success.

Company expertise

From design to delivery, EFFILUX uses all its expertise and knowledge to meet customer's specifications.

Engineering knowledge
> 35 years of experience in optical design.
> Experience in industrial integration.
> LED expertise.
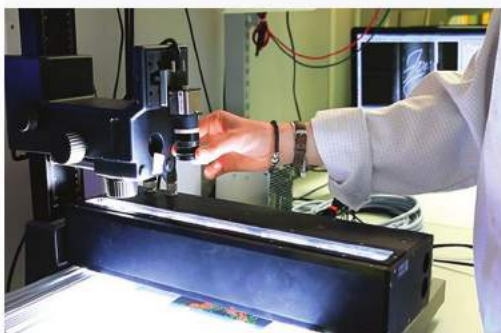
Outsourcing Network
> Proven mechanical subcontractors.
> Electronic partners for design and high volume manufacture.
> Partnerships with leading optical manufacturers.

Reactivity and flexibility
> A reactive team to meet your goals.
> Delivery of the most standard products within a week.

All lighting system is tested and validated to deliver to the customer a reliable and robust product.

Company expertise

EFFILUX offers efficient and technologically advanced lightings.

We provide quality products to meet your requirements. For us quality is a key point !

Services definition of need

For each machine vision project, a lighting solution must be tested and validated. EFFILUX reviews your application for free, provides you advice and technical support to finally deliver you either a standard product of its range, a custom development (see page 7).

Your specifications ? (*see Annex page 80*)
Optical ?
Mechanical ?
Electronical ?
Environment ?
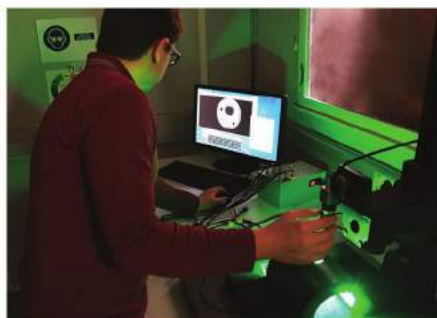
Free feasability
EFFILUX helps its customers to determine the best lighting solution within the constraints of the project.

Loans of standard products
EFFILUX provides loan units to be shipped at customer's in order to accelerate tests and feasabilities.

Demo package
EFFILUX offers the opportunity for its partners to acquire demo package cases at discounted prices.

Services custom development

EFFILUX designs, prototypes and manufactures tailored lighting systems for machine vision companies.

After an industrialization step, EFFILUX is able to deliver to its customers opto-electro-mechanical LED systems that meet their technical specifications and economical requirements.

> Specifications

Optical : wavelength, intensity / illuminance, power... ?

Mechanical: dimensions, thermal... ?

Electronical : power supply, connectivity, auto-strobe... ?

> Mechanical design

DS SolidWorks

> Optical design

LightTools

Zemax
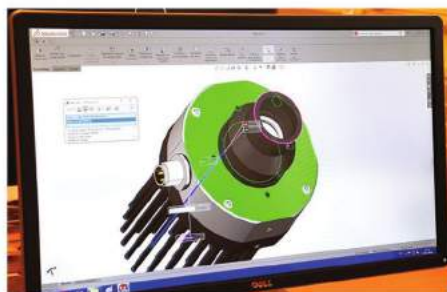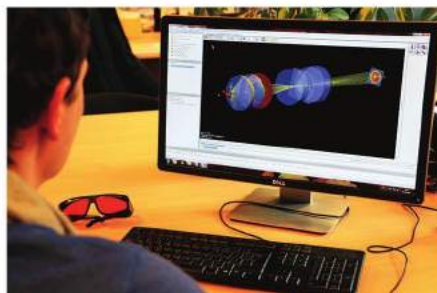
> Electronic design and thermal study

pads

FloTHERM®

Services custom development

> ## Optical set up

Optical laboratory to test and quickly validate the feasibility of the project.

> ## Prototyping

Mechanical

Electronical

> ## OEM development

If project is duplicated, EFFILUX performs an industrialization study following the specified quantities and cost targets of its customers.

> Why choosing and trusting EFFILUX ?

The custom development represents **50%**.

Added values

- Project management from specifications to mass delivery
- Optical, mechanical and electronical research department
- Mastery of LED technology
- Optical expertise
- Industrialization expertise
- Proven experience in sensors and machine vision
- Quality
- Reactivity
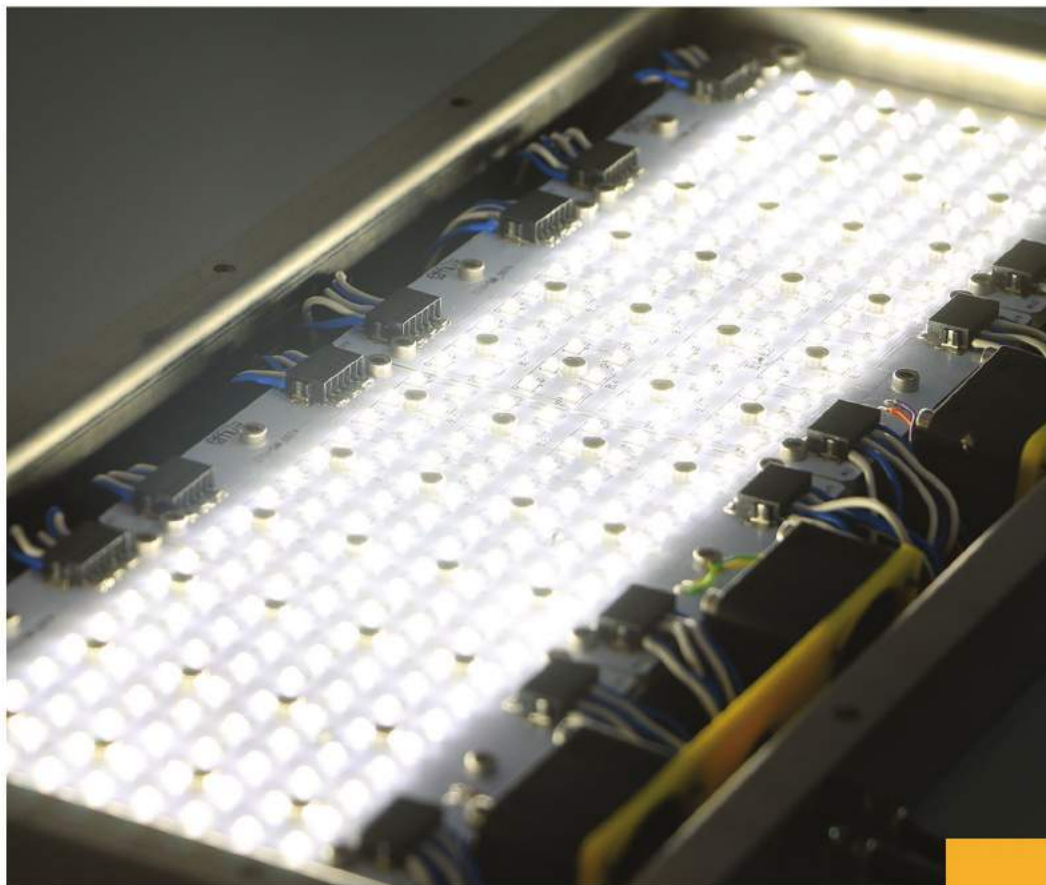
Services custom development

> Examples of custom projects

Ø109 mm

EFFI-Sharp custom
Large projector

L = 3250 mm

EFFI-Line custom
High power large LED bar

Ø300 mm

L projector at distance of 50m
Safety markings

EFFI-Lase custom
Cloud of dots projector

EFFI-Lase custom
2,5 times more powerful than EFFI-Lase Power

EFFI-Flex custom
Tricolor - 3 wavelengths
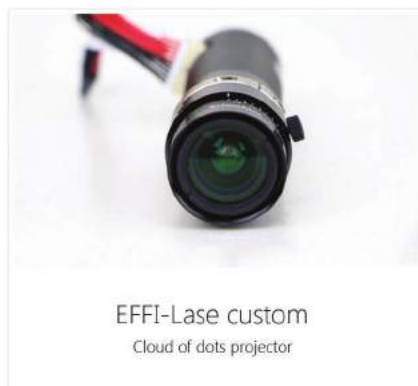
LED bar

EFFI-Flex adjustable beam angle LED bar

Auto-strobe version available

- Description

EFFI-Flex is a product that suits your needs with **different lens adjustment positions**. It is an adjustable product in term of wavelength, a compact and easy to install product.

The EFFI-Flex led bars are fitted with **high power LED**. Through its diffusers (transparent, semi-diffuse and opaline) and polarizers, EFFI-Flex provides a **directional, darkfield or diffuse lighting** adapted to many machine vision applications.

- Applications

• *Automatic identification applications*

• *Quality control*

• *...*
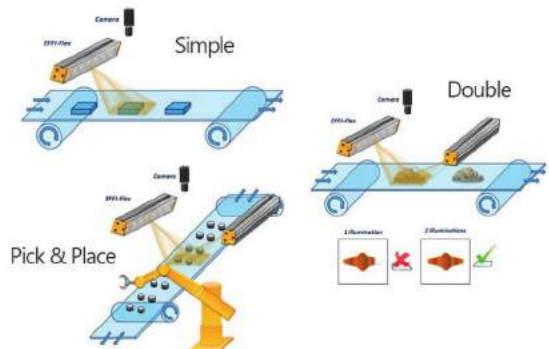
EFFI-Flex adjustable beam angle LED bar

- Optical configurations

> Length depending on number of LED

WW : number of LED	1	3	5	10	15	...
Standard version	55 mm	95 mm	135 mm	235 mm	335 mm	More than 4 m
1 LED / 2 positions version	-	-	235 mm	435 mm	635 mm	More than 4 m

Part number : EFFI-FLEX-**WW**...

If 1 LED / 2 version, add -L2 (Length X 2) after the number of LED

> Available wavelengths

Color	● UV 365*	● UV	● Blue	● Green	● Red	● IR	○ White (T°= 5500 K ± 500 K)
XXX : wavelength (nm)	365	405	465	525	625	850	000

* If UV 365: no lens (not supported) and glass window

Part number : EFFI-FLEX-**WW**-**XXX**...

if RGB : -RGB
Other wavelengths are available on request : 385nm, 660 nm, 740 nm, 940 nm...

> Windows

TR : Transparent   SD : Semi-diffuse   OP : Opaline

EFFILUX offers **different types of interchangeable windows** to find a good compromise between **power** and **homogeneity** depending on the nature of the object to control.

+ Powerful ←————————————————→ + Homogeneous

Part number : EFFI-FLEX-**WW**-**XXX**-**YY**...

YY : TR, SD ou OP
If not specified, default semi-diffuse window

> Emission angle according to the lens position

EFFI-Flex offers **4 lens configurations**, manualy adjustable to change the angle of emission.

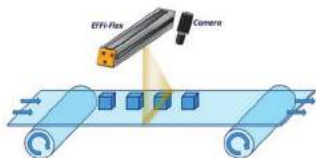| Position	P0*	P1	P2	P3
Angle	90° *Without lens*	45°	25°	10°

Part number : EFFI-FLEX-**WW**-**XXX**-**YY**-**ZZ**
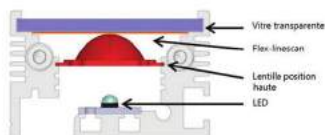
ZZ : P0, P1, P2 ou P3
If not specified, default P2 position
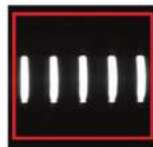
EFFI-Flex adjustable beam angle LED bar

> EFFI-Flex-Linescan

Thanks to its optical accessory Flex-Linescan, the led bar EFFI-Flex is transformed into a **linear lighting** or a **darkfield lighting** : EFFI-Flex-Linescan.

| Vitre transparente |
| Flex-linescan |
| Lentille position haute |
| LED |

Configuration   Without linescan   With linescan

Part number : EFFI-FLEX-WW-XXX-TR-P3-LS

LS : flex-linescan accessory
If flex-linescan, add -LS in the part number
Possibility to buy only the accessory

> Polarizer

The optical accessory Polarizer eliminates **glare caused by the lighting** on parts to control. The camera can then analyze the part, without being disturbed by the **glow effects.**

Without polarizer   With polarizer

Part number : EFFI-FLEX-WW-XXX-YY-ZZ-POL

POL : polarizer accessory
If polarizer, add -POL in the part number
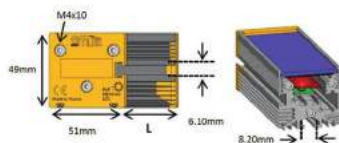*Possibility to buy only the accessory*

> Custom

On request

Cylindrical lens
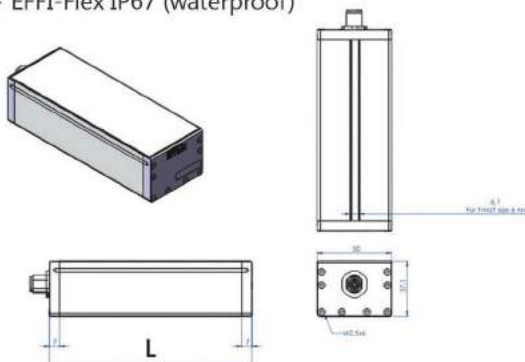
EFFI-Flex adjustable beam angle LED bar

- Mechanical configurations

> Standard EFFI-Flex

Version	1 LED	3 LED	5 LED	10 LED	15 LED	20 LED	25 LED	30 LED	...
L : 1 LED / 1 position (mm)	55	95	135	235	335	435	535	635	More than 4 m
L : 1 LED / 2 positions (mm)	-	-	235	435	635	835	1035	1235	More than 4 m

> EFFI-Flex IP67 (waterproof)

Advantages

- IP67
- Smooth walls to avoid dust accumulation
- Water cooling
- Passive cooling (with heatsink)

Version	1 LED	3 LED	5 LED	10 LED	15 LED	20 LED	25 LED	30 LED	...
L : 1 LED / 1 position (mm)	55	95	135	235	335	435	535	635	More than 4 m
L : 1 LED / 2 positions (mm)	-	-	235	435	635	835	1035	1235	More than 4 m

ⓘ The optical and electronical characteristics are the same as those of the standard EFFI-Flex.

The part number is build in the same way by adding -IP67 between EFFI-FLEX and the wavelength *(example : EFFI-FLEX-IP67-625...)*
Only the mechanical characteristics change.

See optical configurations page 13
See electronical configurations page 16

> Custom

On request

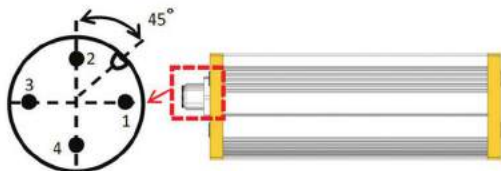Positions of connectors, customized cheeks...

EFFI-Flex adjustable beam angle LED bar

- Electronical configurations

> Connectivity

EFFI-Flex is powered by a 24V constant voltage. DIM pin should be connected, it allows synchronization with the camera.
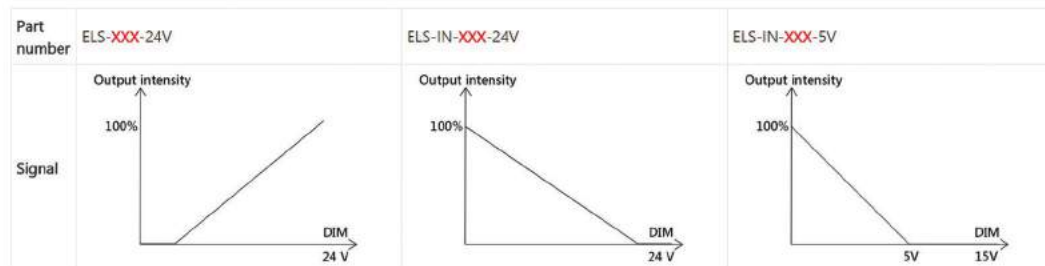
Standard mode : M12 - Auto-strobe

Pin number	Cable color	Designation
1	brown	+24V
2	white	n.a.
3	blue	GND
4	black	DIM - max 24V
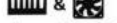
> Drivers

Auto-strobe : **standard electronic**

Response time = 15 µs
Rising time = 10 µs

Part number	ELS-XXX-24V	ELS-IN-XXX-24V	ELS-IN-XXX-5V
Signal			

		Cooling system			
XXX	Output current (mA) [0-100%]	EFFI-Flex	EFFI-Flex 1 LED/2	EFFI-Flex IP67	EFFI-Flex IP67 1 LED/2
350	0-350 mA	Passive cooling		Passive cooling	
500	0-500 mA	Passive cooling + fan (if duty cycle > 75%)	Passive cooling	Passive cooling + fan (if duty cycle > 50%)	Passive cooling
700	0-700 mA	Passive cooling + fan (if duty cycle > 50%)		Passive cooling + fan (if duty cycle > 30%)	
1000	0-1000 mA	From a duty cycle > 30%, contact us.			

Part number : EFFI-FLEX-[...]*-ELS-XXX-24V

XXX : output current (100%)
* [...] : see optical configurations page 13

EFFI-Smart double row LED bar

Auto-strobe version available

- Description

EFFI-Smart is a double row high power LED bar available in **many wavelengths** and in **3 configurations** (2 rows of 3, 12 or 36 LED). This is **the most powerful solution** of EFFILUX (2 times more powerful than the previous LED bar EFFI-Flex).

Providing **IP65 sealing**, the product is **customizable** by the customer He can open it to change the position of the lens (4 positions) and the window (transparent, semi-diffuse and opaline). Therefore, the client controls both the emission angle and the homogeneity/power.

EFFI-Smart is somehow the assembly of tricks and technologies of EFFILUX in one product :
- Robust
- Waterproof IP65
- Flexible
- Chainable : double I/O connectors.

- Applications

- *Automatic identification applications*

- *Quality control*

- *...*

EFFI-Smart double row LED bar

- Optical configurations

> Length depending on number of LED

WW : number of LED	6	12	36
Configuration	2 rows of 3 LED	2 rows of 6 LED	2 rows of 18 LED

Part number : EFFI-SMART-**WW**...

> Available wavelengths

Color	● Blue	● Green	● Red	● IR	○ White (T°= 5500 K ± 500 K)
XXX : wavelength (nm)	465	525	625	850	000

Part number : EFFI-SMART-**WW**-**XXX**...

Other wavelengths are available on request.

> Windows
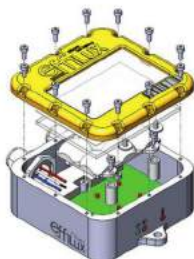
EFFILUX offers **different types of interchangeable windows** to find a good compromise between **power** and **homogeneity** depending on the nature of the object to control.

TR : Transparent

SD : Semi-diffuse

OP : Opaline

Référence : EFFI-SMART-**WW**-**XXX**-**YY**...

YY : TR, SD ou OP
If not specified, default semi-diffuse window

> Emission angle according to the position of the lens

EFFI-Smart offers **4 lens configurations**, manualy adjustable to **change the emission angle.**

ZZ : position	P0	P1	P2	P3
Angle	90° : without lens	45°	25°	10°

Part number : EFFI-SMART-**WW**-**XXX**-**YY**-**ZZ**

ZZ : P0, P1, P2 ou P3
If not specified, default P1 position

EFFI-Smart double row LED bar

> Polarizer

The optical accessory Polarizer eliminates **glare caused by the lighting** on parts to control. The camera can then analyze the part, without being disturbed by the **glow effects**.

Without polarizer

With polarizer

Part number : EFFI-SMART-WW-XXX-YY-ZZ-**POL**

POL : polarizer accessory
If polarizer, add -POL in the part number
Possibility to buy only the accessory

> Smart-Linescan

The optical accessory Smart-Linescan helps to focus and homogenize the light beam in one direction.
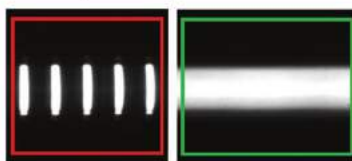
Without linescan

With linescan

(i) Contact us

- Mechanical configurations

> EFFI-Smart 6

32

70.2

> EFFI-Smart 12

3x Ø 4.2

120.2

> EFFI-Smart 36

4x Ø 4.2

70.2   87

300.2
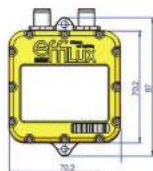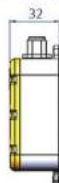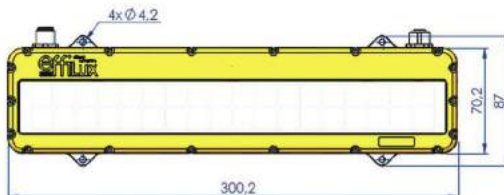
- Electronical configurations

> Connectivity
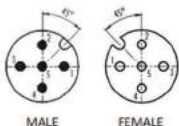
MALE   FEMALE

Pin number	Cable color	Designation
1	brown	+24V
2	white	NPN : triggering on low state
3	blue	GND
4	black	PNP: triggering on high state
5	Grey	AIC (Analog Intensity Control : 0-10V) - max 24V

Analog Intensity Control

0V < U_{AIC} < 2V → LED OFF
2V < U_{AIC} < 10V → ≈20% < I_{LED} < 100%
10V < U_{AIC} < 24V → LED ON 100%

Strobe pulse

0s < t_p < 2s → I_{LED}=1000mA
t_p > 2s → I_{LED}=150mA
If AIC>10V
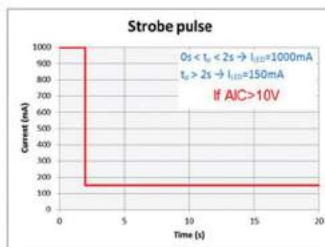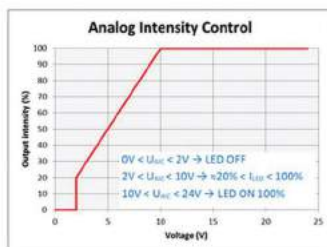
EFFI-LBRX small LED bar

- Description

EFFI-LBRX * is a very compact, small sized, easy to integrate lighting in applications where mechanical constraints quickly become annoying.

These systems can be mounted with different angles of inclination to illuminate different areas.

* Available for France, Germany and Switzerland

- Applications

- General illumination
- Label inspection
- Character inspection
- Code recognition
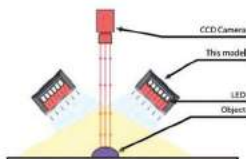
- Part number
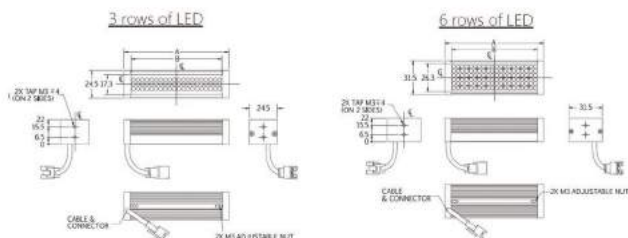
> 3 rows of LED

Part number	A (mm)	B (mm)	Color	Voltage / Power	Current
EFFI-LBRX-00-040-3-X	52.0	40.0	● / ● ● ○	24V / 0.79W / 24V / 1.01W	33mA / 42mA
EFFI-LBRX-00-080-3-X	92.0	80.0	● / ● ● ○	24V / 1.58W / 24V / 2.02W	66mA / 84mA
EFFI-LBRX-00-120-3-X	132.0	120.0	● / ● ● ○	24V / 2.38W / 24V / 3.02W	99mA / 126mA
EFFI-LBRX-00-160-3-X	172.0	160.0	● / ● ● ○	24V / 3.17W / 24V / 4.03	132mA / 168mA
EFFI-LBRX-00-200-3-X	212.0	200.0	● / ● ● ○	24V / 3.96W / 24V / 5.04W	165mA / 210mA

> 6 rows of LED

Part number	A(mm)	B (mm)	Color	Voltage / Power	Current
EFFI-LBRX-00-040-6-X	52.0	40.0	● / ● ● ○	24V / 1.87W / 24V / 1.73W	78mA / 72mA
EFFI-LBRX-00-080-6-X	92.0	80.0	● / ● ● ○	24V / 3.74W / 24V / 3.46W	156mA / 144mA
EFFI-LBRX-00-120-6-X	132.0	120.0	● / ● ● ○	24V / 5.62W / 24V / 5.18W	234mA / 216mA
EFFI-LBRX-00-160-6-X	172.0	160.0	● / ● ● ○	24V / 7.49W / 24V / 6.91W	312mA / 288mA
EFFI-LBRX-00-200-6-X	212.0	200.0	● / ● ● ○	24V / 9.36W / 24V / 8.64W	390mA / 360mA

Ring

EFFI-Ring adjustable beam power ring

Auto-strobe version available

- Description

EFFI-Ring meets the major needs of industry by enabling the user **to adjust the lighting beam angle**.

To **focus more or less the light beam** (P0 : 90, P1 : 45 °, P2 : 25° and P3 : 10°), simply remove the product and change the position of the lens.

- Applications

• *Quality control*

• *Pick and Place.*

Camera

EFFI-Ring

EFFI-Ring adjustable beam power ring

- Optical configurations

> Available wavelengths

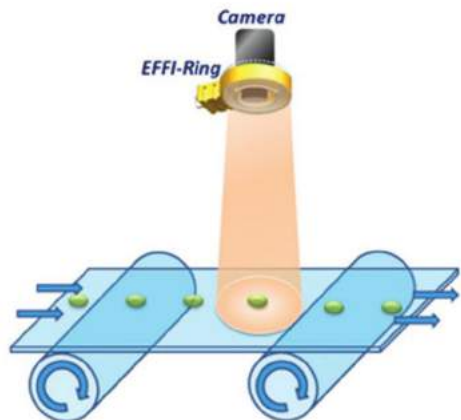| Color	● UV	● Blue	● Green	● Red	● IR	○ White (T°= 5500 K ± 500 K)
Wavelength (nm) : XXX	405	465	525	625	850	000

Part number : EFFI-RING-XXX...

Tricolor versions :
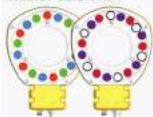
If RGB : -RGB, si WUI (White-UV-IR) : -WUI

> Windows

TR : Transparent	SD : Semi-diffuse	OP : Opaline

+Powerful ← —————————————— → +Homogeneous

EFFILUX offers **different types of interchangeable windows** to find a good compromise between **power** and **homogeneity** depending on the nature of the object to control.

Part number : EFFI-RING-XXX-YY...

YY : TR, SD or OP
If not specified, default semi-diffuse window

> Emission angle according to the lens position

EFFI-Flex offers **4 lens configurations**, manually adjustable to **change the emission angle**.

Position	P0*	P1	P2	P3
Angle	90° * without lens	45°	25°	10°

Part number : EFFI-RING-XXX-YY-ZZ

ZZ : P0, P1, P2 ou P3
If not specified, default position P2

> Polarizer

The optical accessory Polarizer eliminates **glare caused by the lighting** on parts to control. The camera can then analyze the part, without being disturbed by the **glow effects.**

Without polarizer

With polarizer

Part number : EFFI-RING-XXX-YY-ZZ-POL

POL : polarizer accessory
If polarizer, add -POL in the part number
Possibility to buy only the accessory, see part number here

EFFI-Ring adjustable beam power ring

- Mechanical configurations
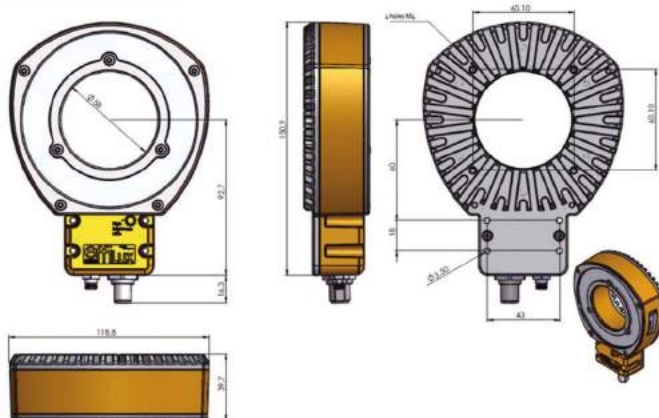
(i) EFFI-Ring is compatible with most standard cameras thanks to its fixing accessory.

> IP65 sealing

(i) EFFI-Ring is an IP65 product. Be careful to put the joints as originally when reassembling.

> Fixing accessory for camera

EFFILUX proposes a camera mounting bracket for combining an EFFI-Ring lighting with a camera.

- Electronical configurations

> Connectivity

Electronic steering choices

Standard mode : M12 - auto-strobe
Expert mode : M8 - direct control
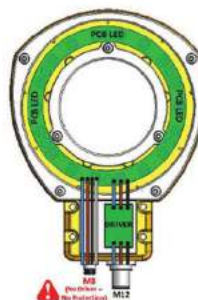
EFFI-Ring adjustable beam power ring

M12 connector - internal driver (standard mode)

Number	Pin color	Designation - Monochrome version	Designation - RGB/WUI versions
1	brown	+24V	+24V
2	white	n.a.	DIM blue/white
3	blue	GND	GND
4	black	DIM - max 24V	DIM red/UV- max 24V
5	grey	n.a.	DIM green/IR- max 24V

(i) EFFI-Ring is powered by a 24V DC source.

Dimming control

DIM Voltage U$_{DIM}$ (V)	Light intensity	DIM consumption
0-3	OFF	0,1 mA@3V
5-24	ON	0,8 mA@24V

⚠ Auto-strobe mode : Respect a duty cycle less than 0,15.

Characteristics of the pulse

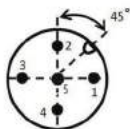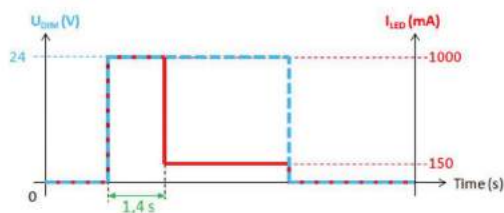| Designation	Time (µs)
Rise time (T$_M$)[1]	4-15
Response rise time (T$_{RM}$)[2]	25
Fall time (T$_D$)[3]	10
Response fall time (T$_{RD}$)[4]	5

(1) From 10% to 90% of the peak value of driver signal
(2) From 90% to 10% of the peak value of driver signal
(3) From the beginning of the DIM signal to 10% of the peak value of driver signal
(4) From the ending of the DIM signal to 90% of the peak value of driver signal

⚠ M8 connector - direct control (expert mode)
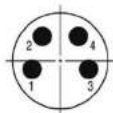
Pin color	Cable color	Designation - monochrome version	Designation - RGB/WUI versions
1	brown	+V$_{common}$	+V$_{common}$
2	white	GND 1	GND 1 red/UV
3	blue	GND 2	GND blue/white
4	black	GND 3	GND green/IR

	F (Hz)				
T pulse (µs)	1	5	10	15	20
100 000	1.0 A				
50 000	1.2A				
10 000		1.5 A		1.0 A	
1000		2.0 A			
100		2.5 A			

⚠ The maximum current for a given frequency and pulse time can not be exceeded !

(i) A pulse controller can be used to power EFFI-Ring with the M8 connector.

EFFI-DFR diffused ring lighting

- Description

EFFI-DFR3 * is a diffused LED ring lighting with high luminous surface. The conical illumination surface makes it possible to illuminate a work piece from almost any angle.
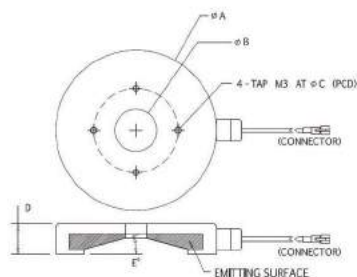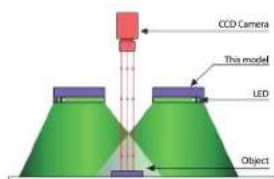
This product is easy to integrate with its reduced dimensions and its simple and practical attachment possibilities.

Available for France, Germany and Switzerland

- Applications

- *Printed characters reading*
- *PCB inspection*
- *Caps control*
- *OCR inspection*

- Part number

Part number	A (mm)	B (mm)	C (mm)	D (mm)	E*	Color (X)	Voltage / Power	Current
EFFI-DFR3-00-050-1-X	50.8	8.0	25.0	13.0	0	● ● ● ○	24V / 1.80W 24V / 1.68W	75mA 70mA
EFFI-DFR3-00-070-1-X	76.2	21.0	52.0	13.0	0	● ● ● ○	24V / 2.88W 24V / 3.96W	120mA 165mA
EFFI-DFR3-00-100-1-X	100.0	30.0	80.0	13.0	0	● ● ● ○	24V / 3.96W 24V / 5.04W	165mA 210mA
EFFI-DFR3-00-120-1-X	126.5	45.0	106.0	13.0	0	● ● ● ○	24V / 5.04W 24V / 6.48W	210mA 270mA
EFFI-DFR3-15-070-1-X	76.2	21.0	52.0	13.0	15	● ● ● ○	24V / 2.88W 24V / 3.96W	120mA 165mA
EFFI-DFR3-15-100-1-X	100.0	30.0	80.0	15.0	15	● ● ● ○	24V / 3.96W 24V / 5.04W	165mA 210mA
EFFI-DFR3-15-120-1-X	126.5	30.0	106.0	18.0	15	● ● ● ○	24V / 5.04W 24V / 6.48W	210mA 270mA
EFFI-DFR3-30-050-1-X	50.8	8.0	25.0	15.0	30	● ● ● ○	24V / 1.80W 24V / 1.68W	75mA 70mA
EFFI-DFR3-30-070-1-X	76.2	21.0	52.0	15.0	30	● ● ● ○	24V / 2.88W 24V / 3.96W	120mA 165mA
EFFI-DFR3-30-100-1-X	100.0	30.0	80.0	23.0	30	● ● ● ○	24V / 3.96W 24V / 5.04W	165mA 210mA
EFFI-DFR3-30-120-1-X	126.5	30.0	106.0	28.0	30	● ● ● ○	24V / 5.04W 24V / 6.48W	210mA 270mA

EFFI-DL diffused square lighting

- Description

EFFI-DL * is **a diffused LED lighting** having **a lateral illumination**. Indeed, the light comes from the sides of the lighting for **a flux emitted conically** towards the workpiece. This system allows both **a darkfield and diffused light** for different types of inspections.

This lighting is used close to the surface to be inspected, at **very small distances of the samples**.

Available for France, Germany and Switzerland
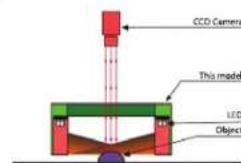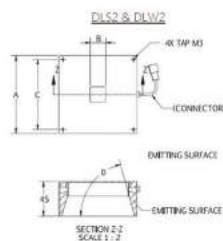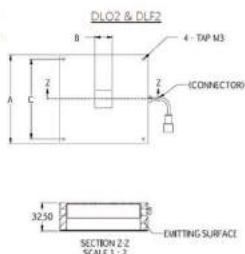
- Part number

> DLQ2 & DLF2

Part number	A (mm)	B (mm)	C (mm)	Color (X)	Voltage / Power	Current
EFFI-DLQ2-90-030-1-X	31.8	10	21	● ● ● ○	24V / 1.44W	60mA
EFFI-DLQ2-90-050-1-X	50.8	10	40	● ● ● ○	24V / 2.88W	120mA
EFFI-DLQ2-90-070-1-X	76.2	20	66	● ● ● ○	24V / 2.88W 24V / 4.32W	120mA 180mA
EFFI-DLQ2-90-100-1-X	101.6	20	91.5	● ● ● ○	24V / 4.32W 24V / 5.76W	180mA 240mA
EFFI-DLF2-90-050-1-X	50.8	26	40	● ● ● ○	24V / 2.88W	120mA
EFFI-DLF2-90-070-1-X	76.6	55	66	● ● ● ○	24V / 2.88 24V / 4.32W	120mA 180mA
EFFI-DLF2-90-100-1-X	101.6	80	91.5	● ● ● ○	24V / 4.32W 24V / 5.76W	180mA 240mA

> DLS2 & DLW2

Part number	A (mm)	B (mm)	C (mm)	D°	Color (X)	Voltage / Power	Current
EFFI-DLS2-60-050-1-X	50.8	16.0	40.0	60	● ● ● ○	24V / 2.88W	120mA
EFFI-DLS2-60-070-1-X	76.2	20.0	66.0	60	● ● ● ○	24V / 2.88W 24V / 4.32W	120mA 180mA
EFFI-DLS2-60-100-1-X	101.6	20.0	91.5	60	● ● ● ○	24V / 4.32W 24V / 5.76W	180mA 240mA
EFFI-DLW2-60-070-1-X	76.2	40.0	66.0	60	● ● ● ○	24V / 2.88W 24V / 4.32W	120mA 180mA
EFFI-DLW2-60-100-1-X	101.6	66.0	91.5	60	● ● ● ○	24V / 4.32W 24V / 5.76W	180mA 240mA

EFFI-DLR diffused angular lighting
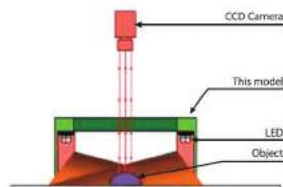
- Description

EFFI-DLR2 * is a diffused LED ring lighting that eliminates reflections on shiny surfaces. It is used very close to the workpieces. Its dimensions make it a very compact and easy to integrate system.

* Available for France, Germany and Switzerland

- Applications

• *Characters recognition on shiny surfaces*

• *Presence/absence detection*

• *Defects control*

- Part number
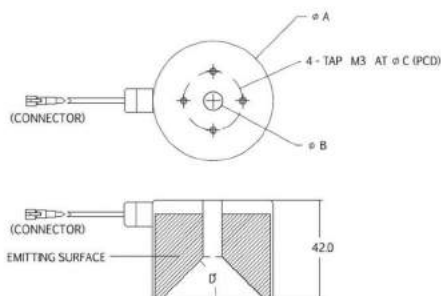
Part number	A (mm)	B (mm)	C (mm)	D°	Color (X)	Voltage / Power	Current
EFFI-DLR2-45-050-2-X	50.8	8	25	45	● ● ● ○	24V / 1.44W 24V / 1.80W	60mA 75mA
EFFI-DLR2-45-070-2-X	76.2	21	52	45	● ● ● ○	24V / 2.88W 24V / 3.60W	120mA 150mA
EFFI-DLR2-45-100-2-X	100	45	80	45	● ● ● ○	24V / 3.60W 24V / 4.68W	150mA 195mA
EFFI-DLR2-45-120-2-X	126.5	71	106	45	● ● ● ○	24V / 4.68W 24V / 6.12W	195mA 255mA
EFFI-DLR2-60-050-2-X	50.8	18	25	60	● ● ● ○	24V / 1.44W 24V / 1.80W	60mA 75mA
EFFI-DLR2-60-070-2-X	76.2	43	52	60	● ● ● ○	24V / 2.88W 24V / 3.60W	120mA 150mA
EFFI-DLR2-60-100-2-X	100	68	80	60	● ● ● ○	24V / 3.60W 24V / 4.68W	150mA 195mA
EFFI-DLR2-60-120-2-X	126.5	93	106	60	● ● ● ○	24V / 4.68W 24V / 6.12W	195mA 255mA

EFFI-HPD uniform ring lighting

- Description

EFFI-HPD * is a powerful and diffused LED lighting. This ring can be used at different working distances thanks to its high power. It is a very compact, easy to integrate product.

* Available for France, Germany and Switzerland

- Applications

- Shiny surfaces control
- Food packaging control
- Plastic films control
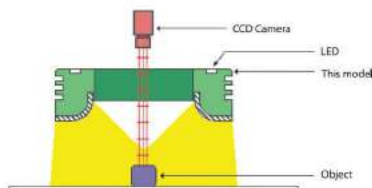
- Part number
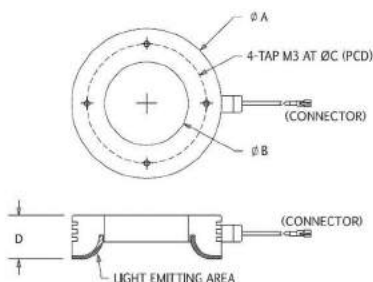
Part number	A (mm)	B (mm)	C (mm)	D (mm)	Color (X)	Voltage / Power	Current
EFFI-HPD-00-070-1-X	75.5	42	60	22	● ● ● ○	24V / 1.80W 24V / 2.16W	75mA 90mA
EFFI-HPD-00-110-2-X	114	68	90	22	● ● ● ○	24V / 3.96W 24V / 4.37W	165mA 182mA
EFFI-HPD-00-170-1-X	176.6	111	150	29.6	● ● ● ○	24V / 18.0W	750mA
EFFI-HPD-00-240-1-X	245	158.5	200	38	● ● ● ○	24V / 25.20W 24V / 26.88W	1050mA 1120mA

EFFI-LLA low angle lighting

- Description

EFFI-LLA * is **a darkfield LED lighting** of different diameters and having **one or more inclined LED rows** :
- **60° or 75°** = low angle
- **90°** = darkfield

It is a compact and easy to integrate lighting in different types of machines (robots, production lines, special machines, conveyors, etc.).

* Available for France, Germany and Switzerland

- Applications

- *Surfaces inspection*

- *Defects, roughness or texture inspection*

- *Scratches or reliefs inspection*

- Part number

> LLA 60 & 75

Part number	A (mm)	B (mm)	C (mm)	D (mm)	E°	F (Row)	Color (X)	Voltage / Power	Current
EFFI-LLA-60-070-2-X	74	41	60	20.5	60	2		24V / 3.60W	150mA
								24V / 4.68W	195mA
EFFI-LLA-60-090-2-X	90	57	75	20.5	60	2		24V / 4.32W	180mA
								24V / 5.76W	240mA
EFFI-LLA-60-150-3-X	151	114	136	23.5	60	3		24V / 11.88W	495mA
								24V / 15.12W	630mA
EFFI-LLA-60-200-2-X	202	167	186	20.5	60	2		24V / 10.80W	450mA
								24V / 14.04W	585mA
EFFI-LLA-75-130-3-X	131	94	116	24.5	75	3		24V / 10.08W	420mA
								24V / 12.96W	540mA
EFFI-LLA-75-170-3-X	175	136	159	24.5	75	3		24V / 13.68W	570mA
								24V / 17.64W	735mA

> LLA 90

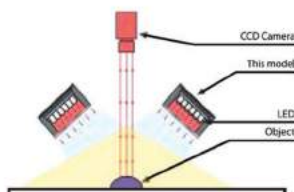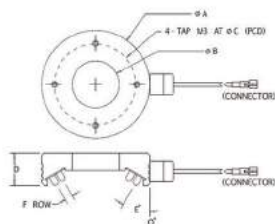| Part number	A (mm)	B (mm)	C (mm)	D (mm)	E°	F (Row)	Color (X)	Voltage / Power	Current
EFFI-LLA-90-050-1-X	56	24	33.5	10.5	90	1		24V / 1.08W	45mA
								24V / 1.44W	60mA
EFFI-LLA-90-080-1-X	80	50	56.5	10.5	90	1		24V / 1.80W	75mA
								24V / 2.52W	105mA
EFFI-LLA-90-100-1-X	101	71	77.5	10.5	90	1		24V / 2.52W	105mA
								24V / 3.24W	135mA
EFFI-LLA-90-150-1-X	151	121	127.5	10.5	90	1		24V / 3.96W	165mA
								24V / 5.04W	210mA
EFFI-LLA-90-180-1-X	181	151	157.5	10.5	90	1		24V / 4.68W	105mA
								24V / 6.12W	135mA
EFFI-LLA-90-210-1-X	211	181	187	10.5	90	1		24V / 5.76W	240mA
								24V / 7.20W	300mA

EFFI-LSW ring lighting

- Description

EFFI-LSW * is a ring lighting having two to five LED rows oriented with an angle ranging from 0° to 45°. It is a compact and easy to integrate product in different types of machines (robots, production lines, special machines, conveyors, etc.).

* Available for France, Germany and Switzerland

- Applications

• Labels inspection

• Flat surfaces inspection

• Inspection of different types of parts (steel, cast iron, plastic, wood...)

- Part number

| Part number	A (mm)	B (mm)	C (mm)	D (mm)	E*	F (row)	Color (X)	Voltage / Power	Current
EFFI-LSW-00-040-2-X	43	15	28	20	0	2		24V / 1.44W 24V / 1.80W	60mA 75mA
EFFI-LSW-00-050-2-X	54	23.5	41	20	0	2		24V / 2.16W 24V / 2.88W	90mA 120mA
EFFI-LSW-00-070-3-X	70	26	56	20	0	3		24V / 4.32W 24V / 5.40W	180mA 225mA
EFFI-LSW-00-090-4-X	92	40	70	20	0	4		24V / 6.48W 24V / 8.28W	270mA 345mA
EFFI-LSW-15-050-2-X	50	28	40	16	15	2		24V / 2.16W 24V / 2.52W	90mA 105mA
EFFI-LSW-15-070-3-X	70	32	56	20.5	15	3		24V / 4.32 24V / 5.76W	180mA 240mA
EFFI-LSW-15-090-4-X	92	47	70	20.5	15	4		24V / 7.92 24V / 10.08W	330mA 420mA
EFFI-LSW-15-100-5-X	103	48	80	22	15	5		24V / 10.80W 24V / 13.68W	450mA 570mA
EFFI-LSW-30-040-2-X	46	20	35	16	30	2		24V / 1.80W 24V / 2.52W	75mA 105mA
EFFI-LSW-30-050-2-X	54	23.5	41	18	30	3		24V / 2.16W 24V / 2.88W	90mA 120mA
EFFI-LSW-30-070-3-X	70	32	56	20	30	3		24V / 4.32W 24V / 5.40W	180mA 225mA
EFFI-LSW-30-090-4-X	92	48	70	22	30	4		24V / 8.28W 24V / 10.44W	345mA 435mA
EFFI-LSW-45-050-2-X	54	25	44	20	45	2		24V / 2.16W 24V / 2.88W	90mA 120mA
EFFI-LSW-45-070-3-X	70	35	60	21	45	3		24V / 4.68W 24V / 5.76W	195mA 240mA
EFFI-LSW-45-090-4-X	92	52	70	24	45	4		24V / 8.28 24V / 10.44W	345mA 435mA
EFFI-LSW-45-100-5-X	100	48	80	30	45	5		24V / 11.16 24V / 14.40W	465mA 600mA

Backlight

EFFI-BL backlight

- Description

EFFI-BL is a large, powerful and homogeneous LED backlight. The high luminance and the homogeneity greater than 90% make it the ideal product for inspection by backlight camera.

The backlight sources are placed behind the part to highlight their figure into "shadow". These lightings offer a very homogeneous, uniform and diffuse light, avoiding the reflections generated by the incidence of light rays on parts to control.

- Applications

• Highlighting the silhouette of the object (maximum contrast between the background and the form)

• Dimensional control and absence / presence of holes

• Transparent and translucent materials control (glass, fabric, printed circuit...)

• Liquid level control in a bottle

• ...

Inspected part

Resulting picture
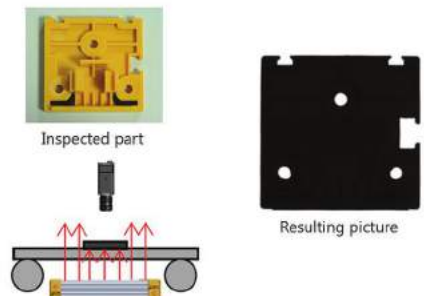
EFFI-BL backlight

- Optical configurations

> Dimensions

XXX : optical length (mm)
YYY : optical width (mm)

EFFILUX offers all possible dimensions for **XXX** and **YYY** every 50 mm up to 1,5 m.

Part number : EFFI-BL-**XXX**-**YYY**...

> Available wavelenghts

Color	● Blue*	● Green*	● Red	● IR	○ White (T°= 5500 k ± 500 K)
ZZZ : wavelength (nm)	465	525	625	850	000

Optional

Part number : EFFI-BL-**XXX**-**YYY**-**ZZZ**

- Mechanical configurations

> EFFI-BL
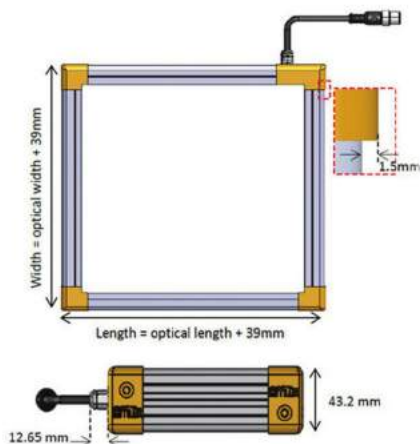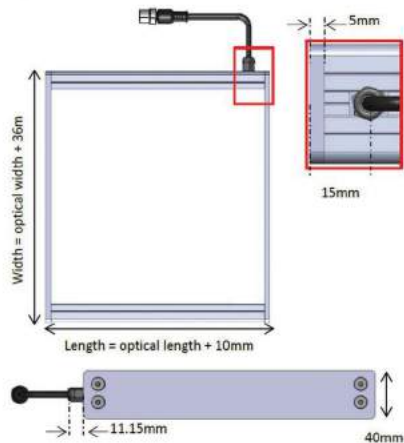
Width = optical width + 39mm
Length = optical length + 39mm
1.5mm
43.2 mm
12.65 mm

> Thin edges EFFI-BL

5mm
15mm
Width = optical width + 36m
Length = optical length + 10mm
11.15mm
40mm

ⓘ Thin edges : add 'T' after the dimension which must be reduced.
Contact EFFILUX for any CAD request.

Example 1 : EFFI-BL-100-200T

L = 236 mm
W = 110 mm

Example 2 : EFFI-BL-100T-200

L = 210 mm
W = 136 mm
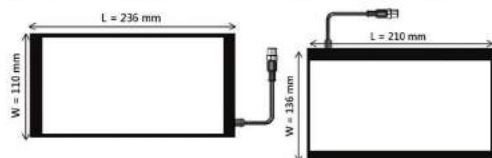
EFFI-BL backlight

- Electronical configurations

> Connectivity

EFFI-BL is connected to the power supply by a M12 4-pin connector.
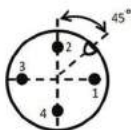
Pin number	Cable color	Designation
1	brown	+24V
2	white	n.a.
3	blue	GND
4	black	DIM - max 24V

EFFI-BL - Power (W)

The power of an EFFI-BL lighting is proportional to its surface and equals 7W for 100mm².

Indeed, an EFFI-BL 100x100 consumes about 7W, an EFFI-BL 100x200 about 14W, an EFFI-BL 200x200 about 28W, etc.

Type and number of connectors depending on the power. 1 M12 connector up to 85W.

From 85W, several M12 connectors are required. It is also possible to replace the M12 by M12 PWR. 1 M12 PWR connector from 85W up to 260W.

> Dimming control

EFFI-BL is powered by a 24V DC source.

By using the DIM pin, the luminous intensity may be increased in a linear way :

- 0V - OFF
- 24V - Full ON
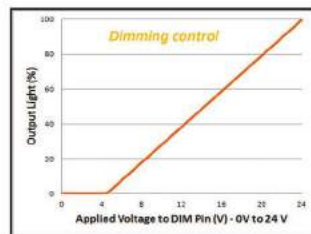
> Power version

- 3 times more powerful
- Compulsory use with a duty cycle < 30% !
- Power = power EFFI-BL X 3

Configuration : 150 mA, strobe mode, only white (000).

ⓘ The standard configuration is 50 mA.
Other configurations are available on request.
If power version, add -S150 at the end of the part number

EFFI-Flex-BL backlight in LED bar version

- Description

EFFI-Flex-BL is commonly used in **backlight mode** to display the **outline of the parts** to be inspected. However, it can also serve as **very diffuse directional lighting**.

This is primarily a lighting for **linear camera**, allowing **control of paper, glass, transparent material**... It is an adjustable product in terme of wavelength (blue to IR), a compact and easy to install product.

- Applications

• *Highlighting the silhouette of the object (maximum contrast between the background and the form)*

• *Dimensional control and absence / presence of holes*

• *Transparent and translucent materials control (glass, fabric, printed circuit...)*

• *...*
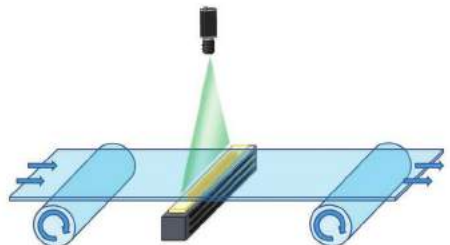
EFFI-Flex-BL backlight in LED bar version

- Optical configurations

> Dimensions

YYY : optical length (mm)

EFFILUX offers all possible dimensions for YYY every 100 mm up to 4 m.

Part number : EFFI-FLEX-BL-YYY...

> Available wavelengths

Color	● Blue	● Green	● Red	● IR	○ White (T° = 5500 K ± 500 K)
ZZZ : wavelength (nm)	465	525	625	850	000

Part number : EFFI-FLEX-BL-YYY-ZZZ

- Mechanical configurations

(i) Contact EFFILUX for any CAD request.

- Electronical configurations

> Connectivity

EFFI-Flex-BL is connected to the power supply by a M12 4-pin connector.
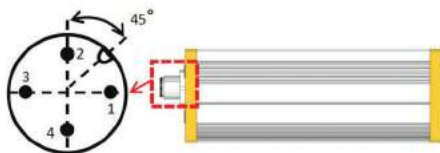
Pin number	Cable color	Designation
1	brown	+24V ± 5%
2	white	n.a.
3	blue	GND
4	black	DIM - max 24V

> Dimming control

EFFI-Flex-BL is powered by a 24V DC source.

Using the DIM pin, the luminous intensity may be increased linearly :

• 0V - OFF
• 24V - Full ON
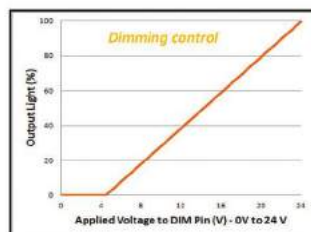
EFFI-BHD small backlight

- Description

EFFI-BHD / BHDS * is a LED backlight designed for the small objects inspection (screws, nuts, pins...). This lighting system is homogeneous at 85% and easy to integrate thanks to its thinness and its attachment to the side.
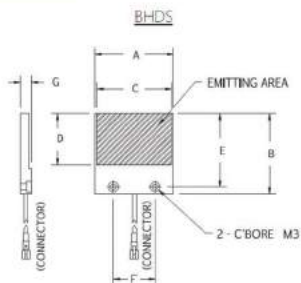
* Available for France, Germany and Switzerland

- Applications

• Quality control with backlight

- Part number

BHDS

BHD
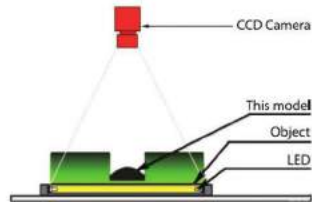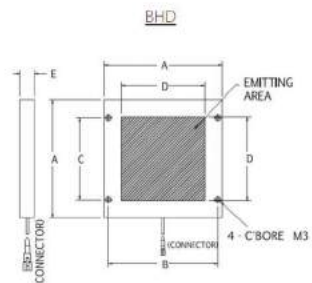
> BHDS

Part number	A (mm)	B (mm)	C (mm)	D (mm)	G (mm)	Color (X)	Voltage / Power	Current
EFFI-BHDS-00-25X36-1-X	38.5	43.5	36.5	25	5.3	● / ● ● ○	24V / 0.36W 24V / 0.48W	15mA 20mA
EFFI-BHDS-00-31X58-1-X	60	43.5	58	31	5.3	● ● ● ○	24V / 0.72W	20mA
EFFI-BHDS-00-070-1-X	98.5	84.5	70	70	5.3	● ● ● ○	24V / 2.16W	30mA

> BHD

Part number	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	Color (X)	Voltage / Power	Current
EFFI-BHD-00-070-1-X	98.5	91.5	68.5	70	5.3	● ● ● ○	24V / 2.88W	120mA
EFFI-BHD-00-100-1-X	128.5	121.5	100	100	5.3	● ● ● ○	24V / 4.32W 24V / 3.84W	180mA 160mA

EFFI-BHS small backlight

- Description

EFFI-BHS3 / BHS4 * is a LED backlight designed for the inspection of small objects (screws, nuts, pins ...). This is a very efficient lighting system : high luminance, uniformity of 85%. It is **easy to integrate** thanks to its thinness and its attachment to the side.
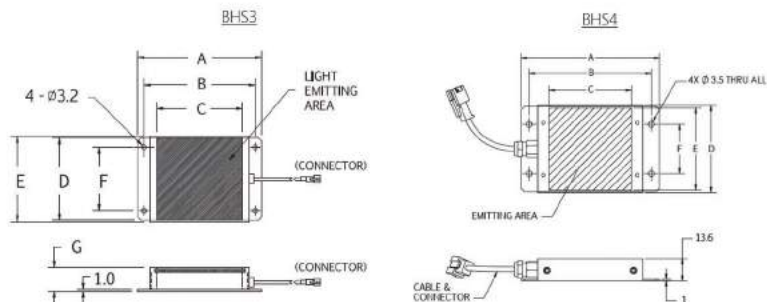
* Available for France, Germany and Switzerland

- Applications

- *Quality control*
- *Pattern recognition*
- *Measurement of the size*

- Part number

BHS3

BHS4

> BHS3

Part number	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	Color (X)	Voltage / Power	Current
EFFI-BHS3-00-020-X	52	44	28	22	24	10	15		24V / 0.72W 24V / 1.20W	30mA 50mA
EFFI-BHS3-00-050-X	78	70	54	52	54	40	15		24V / 2.40W 24V / 3.60W	100mA 150mA
EFFI-BHS3-00-080-X	108	100	84	82	84	70	15		24V / 6.00W 24V / 4.80W	250mA 200mA
EFFI-BHS3-00-100-X	128	120	104	102	104	90	15		24V / 9.12W 24V / 6.84W	380mA 285mA

> BHS4

Part number	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	Color (X)	Voltage / Power	Current
EFFI-BHS4-00-025-X	59.0	49.0	25.0	28.0	25.0	17.0		24V / 1.44W 24V / 0.576W 24V / 0.432W	60mA 24mA 18mA
EFFI-BHS4-00-030-X	64.0	54.0	30.0	33.0	30.0	22.0		24V / 1.44W 24V / 0.576W 24V / 0.432W	60mA 24mA 18mA
EFFI-BHS4-00-050-X	84.0	74.0	50.0	30.0	50.0	30.0		24V / 2.304W 24V / 1.728W	96mA 72mA
EFFI-BHS4-00-60-X	94.0	84.0	60.0	63.0	60.0	40.0		24V / 2.304W 24V / 1.728W	96mA 72mA
EFFI-BHS4-00-75-X	109.0	99.0	75.0	78.0	75.0	38.5		24V / 5.184W 24V / 3.888W	216mA 162mA
EFFI-BHS4-00-90-X	124.0	114.0	90.0	93.0	90.0	70.0		24V / 5.184W 24V / 3.888W	216mA 162mA
EFFI-BHS4-00-100-X	134.0	124.0	100.0	103.0	100.0	60.0		24V / 9.216W 24V / 6.912W	384mA 288mA
EFFI-BHS4-00-120-X	154.0	144.0	120.0	123.0	120.0	100.0		24V / 9.216W 24V / 6.912W	384mA 288mA

Dome and flat dome
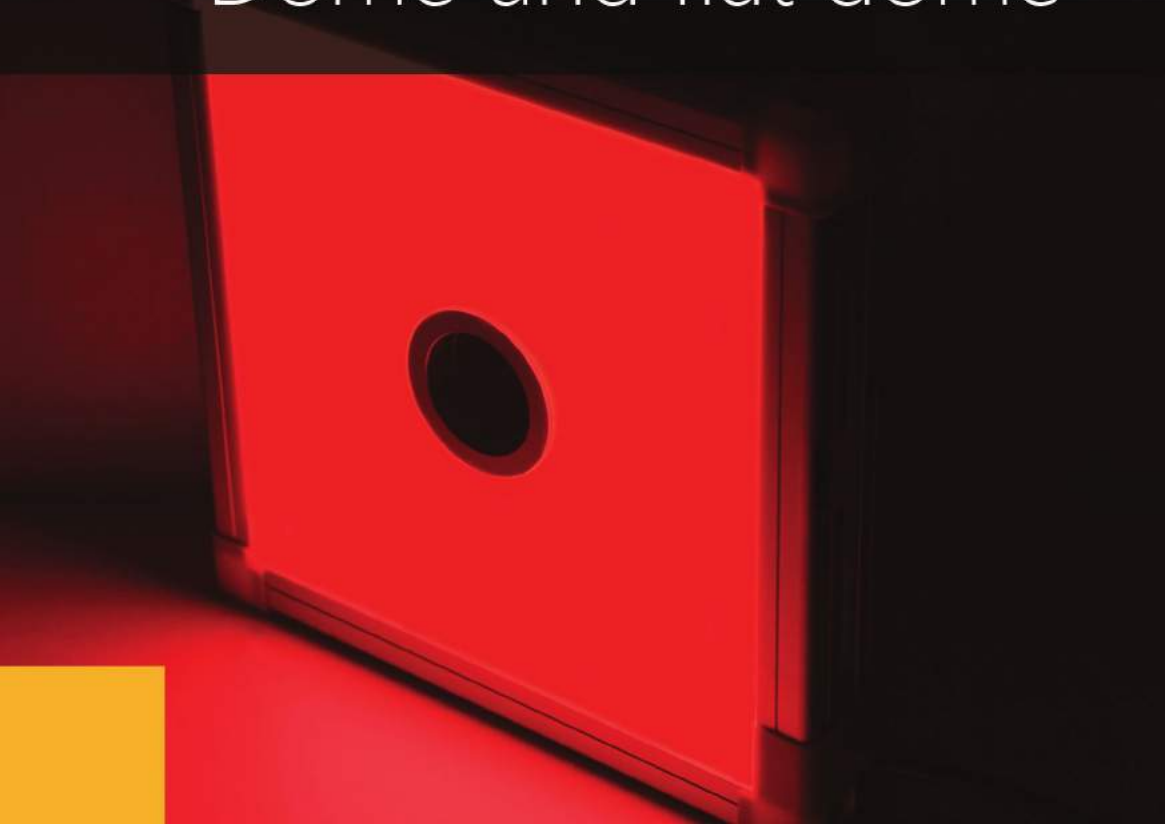
EFFI-FD flat dome
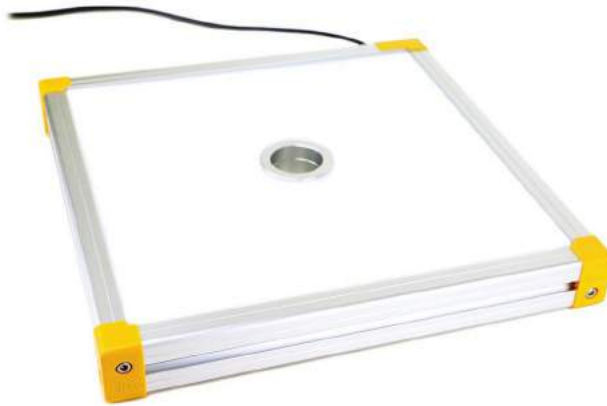
- Description

EFFI-FD is **a diffused LED lighting flat dome** for **reflective surfaces**. It is ideal for machine vision applications where **light is both direct and diffused**.

EFFI-FD offers the advantage of being **easy to integrate** on a production line. It is even often used as the main mechanical basic vision application. EFFI-FD can in some cases replace IDS dome lighting (see page 44) .

- Applications

• *Characters detection on a reflective packaging (metal for example)*

• *Bar code reading on the curved bottom of a box*

• *Objects control whose surface is irregular*

• *...*

EFFI-FD flat dome

- Optical configurations

> Dimensions

XXX : optical length (mm)
YYY : optical width (mm)

EFFILUX offers all possible dimensions for XXX and YYY every 50 mm up to 1,5 m.

Part number : EFFI-FD-XXX-YYY...

> Available wavelengths

Color	● Blue*	● Green*	● Red	● IR	○ White (T°= 5500 K ± 500 K)
ZZZ : wavelength (nm)	465	525	625	850	000

* Optional

Part number : EFFI-FD-XXX-YYY-ZZZ

- Mechanical configurations

> EFFI-FD
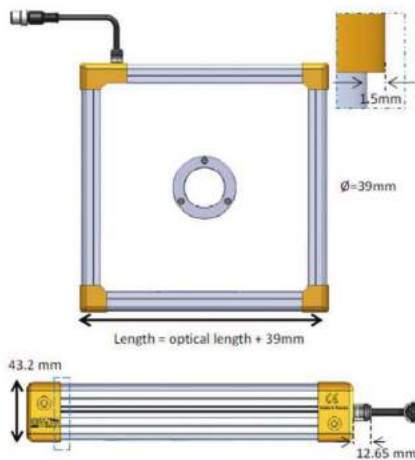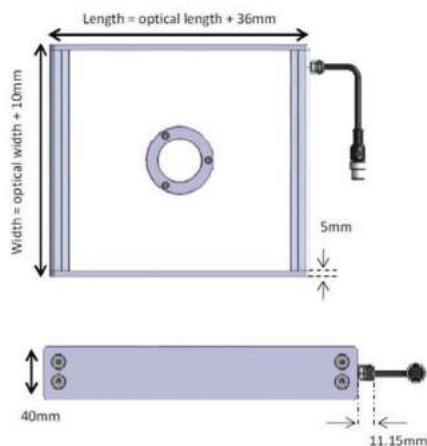
Ø=39mm

1,5mm

Length = optical length + 39mm

43.2 mm

12.65 mm

> Thin edges EFFI-FD

Length = optical length + 36mm

Width = optical width + 10mm

5mm

40mm

11.15mm

ⓘ Thin edges : add 'T' after the dimension which must be reduced.
Contact EFFILUX for any CAD request.

Example 1 : EFFI-FD-100-200T

L = 236 mm
W = 110 mm
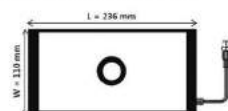
Example 2 : EFFI-FD-100T-200

L = 210 mm
W = 136 mm
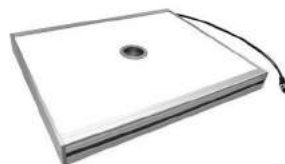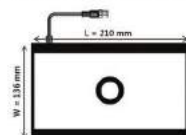
EFFI-FD flat dome

> Fixing accessory for camera

EFFILUX proposes a camera mounting bracket for combining an EFFI-FD lighting with a camera.

> Custom

On request

Positions of connectors, extra thin edges, hole diameter...

- Electronical configurations

> Connectivity

EFFI-FD is connected to the power supply by a M12 4-pin connector.
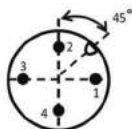
Pin number	Cable color	Designation
1	brown	+24V
2	white	n.a.
3	blue	GND
4	black	DIM - max 24V

EFFI-FD - Power (W)

The power of an EFFI-FD lighting is proportional to its surface and equals 7W for 100mm².

Indeed, an EFFI-FD 100x100 consumes about 7W, an EFFI-FD 100x200 about 14W, an EFFI-FD 200x200 about 28W, etc.

Type and number of connectors depending on the power. 1 M12 connector up to 85W.

From 85W, several M12 connectors are required. It is also possible to replace the M12 by M12 PWR. 1 M12 PWR connector from 85W up to 260W.

> Dimming control

EFFI-FD is powered by a 24V DC source.

By using the DIM pin, the luminous intensity may be increased in a linear way :

• 0V - OFF
• 24V - Full ON
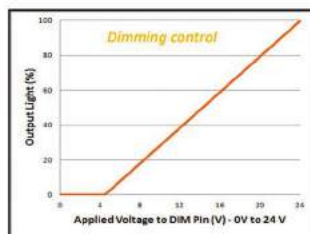
> Power version

• 3 times more powerful
• Compulsory use with a duty cycle < 30% !
• Power = power EFFI-FD X 3

Configuration : 150 mA, strobe mode, only white (000).

ⓘ The standard configuration is 50 mA.
Other configurations are available on request.
If power version, add -S150 at the end of the part number

EFFI-IDS indirect dome lighting

- Description

EFFI-IDS4 * is a **dome lighting**. This system will be ideal for chip, stains on circular or cylindrical objects, solder inspection and substrate inspection.
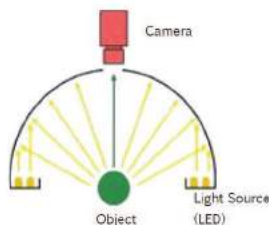
With its **multidirectional and indirect light**, it **deletes the light reflections or shadows** that can be seen on the reflective parts.
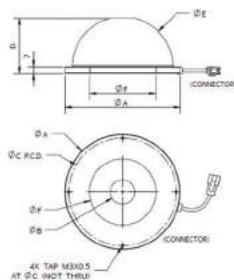
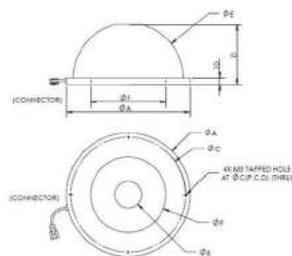*Available for France, Germany and Switzerland*

- Applications

- *Metal parts inspection*
- *Flat surfaces inspection*
- *Reflective parts inspection*

Camera
Light Source (LED)
Object

- Part number

IDS4-00-050/070/100

IDS4-00-150/200/250

Part number	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	Color (X)	Voltage / Power	Current
EFFI-IDS4-00-050-1-X	68	10	60	33.8	53	25	● ●●○	24V / 1.20W 24V / 1.80W	50mA 75mA
EFFI-IDS4-00-070-1-X	95	20	85	44.5	78	41	● ●●○	24V / 2.88W 24V / 4.80W	120mA 200mA
EFFI-IDS4-00-100-1-X	118	25	110	56.8	103	68	● ●●○	24V / 4.80W 24V / 5.04W	200mA 210mA
EFFI-IDS4-00-150-1-X	185	40	172	89.8	165	113	● ●●○	24V / 6.05W 24V / 5.76W	252mA 240mA
EFFI-IDS4-00-200-1-X	232	50	222	112.8	212	160	● ●●○	24V / 9.07W 24V / 8.64W	378mA 360mA
EFFI-IDS4-00-250-1-X	284	50	272	139.4	261.6	212	● ●●○	24V / 11.42W 24V / 12.48W	476mA 520mA

EFFI-IDT indirect tunnel lighting

- Description

EFFI-IDT2 / IDT3 * is **a tunel-shaped dome lighting**. Its advantage over traditional dome is the fact of presenting an open cylindrical shape on each side.
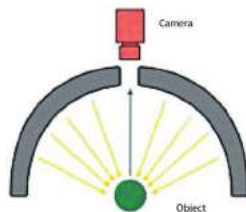
This lighting system is ideal **to overcome the gray areas and bright spots** on reflective cylindrical parts.
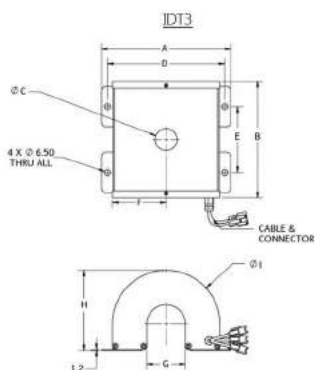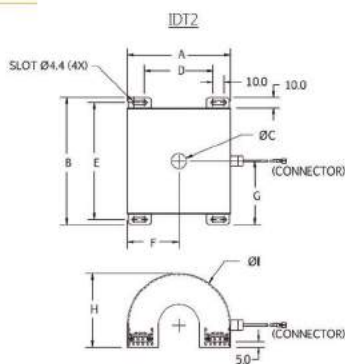
* Available for France, Germany and Switzerland

- Applications

• *Metal parts inspection*

• *Flat surfaces inspection*

• *Reflective parts inspection*

- Part number

> IDT2

Part number	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	Color (X)	Voltage / Power	Current
EFFI-IDT2-00-100-1-X	100	123	15	66.6	113	50	61.5	71	100	● ● ● ○	24V / 4.80W	200mA
EFFI-IDT2-00-150-1-X	150	183	25	116.6	173	75	91.5	96	150	● ● ● ○	24V / 9.60W	400mA
EFFI-IDT2-00-200-1-X	200	183	25	166.6	173	100	91.5	121	200	● ● ● ○	24V / 9.60W	400mA

> IDT3

Part number	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	Color (X)	Voltage / Power	Current
EFFI-IDT3-00-120-1-X	148.0	133.0	25.0	133.6	75.0	61.3	44.0	91.5	122.5	● ● ● ○	24V / 8.64W 24V / 7.68W	360mA 320mA
EFFI-IDT3-00-150-1-X	177.8	163.0	25.0	163.8	103.9	76.3	74.0	106.5	152.5	● ● ● ○	24V / 10.80W 24V / 9.60W	450mA 400mA
EFFI-IDT3-00-200-1-X	227.2	163.0	25.0	213.2	105.0	101.3	124.0	131.5	202.5	● ● ● ○	24V / 10.80W 24V / 9.60W	450mA 400mA

EFFI-IDQ indirect square lighting
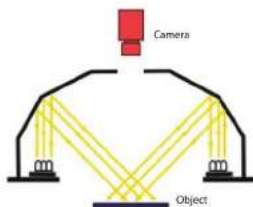
- Description

EFFI-IDQ2 * is a square dome lighting. The light is emitted indirectly and will be reflected on the walls of the system.
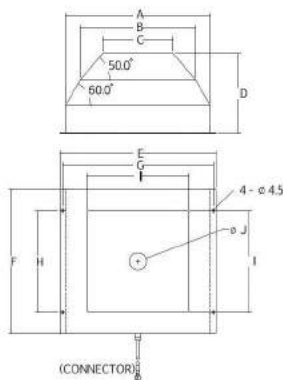
* Available for France, Germany and Switzerland

- Applications

• Metal parts inspection

• Flat surfaces inspection

• Reflective parts inspection

- Part number

Part number	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)	J (mm)	Color(X)	Voltage / Power	Current
EFFI-IDQ2-00-100-1-X	180	144.2	85.5	102	200	180	190	100	100	35	● ● ● ○	24V / 9.60W	400mA
EFFI-IDQ2-00-190-1-X	270	216	131	150	290	270	280	190	190	35	● ● ● ○	24V / 15.36W 24V / 19.20W	640mA 800mA
EFFI-IDQ2-00-300-1-X	412	370.5	193	132	452	412	432	200	318	50	● ● ● ○	24V / 30.72W	1280mA

Linescan

EFFI-Line high power linear lighting

- Description

EFFI-Line is a linear LED lighting designed for **short linear inspection applications.**

The luminance of the diffuser is perfectly **homogeneous** and **extremely powerful.** This quality of light makes it the ideal product for **linear inspection applications on reflective or transparent surfaces.**

- Applications
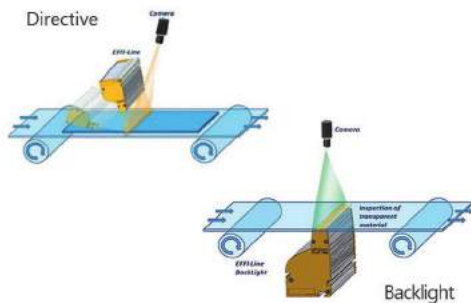
- *Large areas control (paper strips in printing for example)*

- *Control of parts moving at high speed*

- *Highlighting of elements on one line or a specific plan*

- *Quality control*

- *Linear inspection of transparent products (cigarette paper, plastic films...)*

- *Linear inspection of reflective products (glass plates, conformal coatings, solar panels...)*

- *...*

EFFI-Line high power linear lighting

- Optical configurations

> Optical length

EFFILUX offers all possible dimensions for **WW** (mm) every 100 mm up to 4 m.

Part number : EFFI-LINE-**WW**...
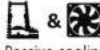
> Available wavelengths

Color	● UV	● Blue	● Green	● Red	● IR	○ White (T°= 5500 k ± 500 K)
XXX : wavelength (nm)	405	465	525	625	850	000

Part number : EFFI-LINE-**WW**-**XXX**...

*If RGB : -**RGB***

> Choice of power

Power version	Cooling system	Illumination at a working distance = 100mm (white)
EFFI-Line	Passive cooling	200 000 Lux
EFFI-Line Power (PWR)	**&** Passive cooling + fan	400 000 Lux
EFFI-Line High Power (HP)	**&** Passive cooling + water cooling	1 000 000 Lux

Part number : EFFI-LINE-**WW**-**XXX**-**YYY**

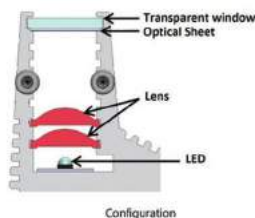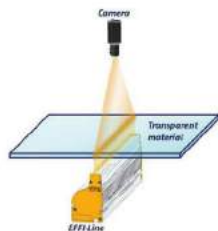*YYY : PWR ou HP if necessary.*

> Lenses position
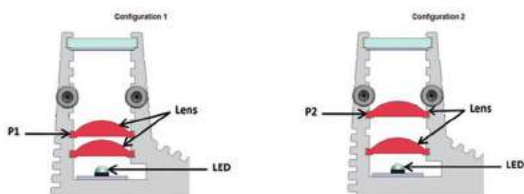
Part number : EFFI-LINE-**WW**-**XXX**-**YY**-**ZZ**

ZZ : P1 or P2

> Linescan effect
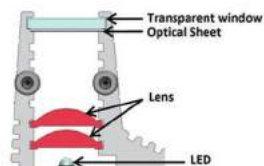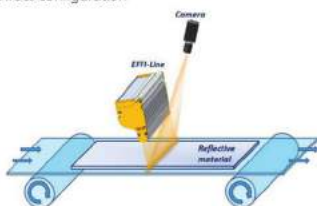
Backlight configuration
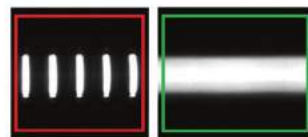
Configuration

Without linescan   With linescan

EFFI-Line high power linear lighting
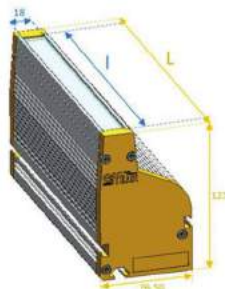
Direct configuration
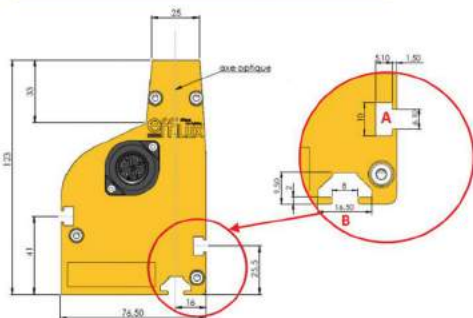

Transparent window
Optical Sheet

Lens

LED
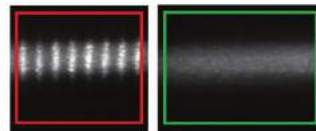
Configuration

Sans linescan

Avec linescan

- Mechanical configurations

axe optique

A

B

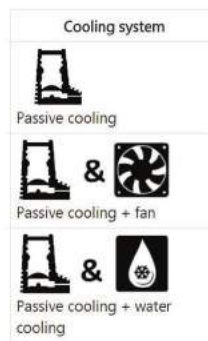| Cooling system |
|---|
| Passive cooling |
| Passive cooling + fan |
| Passive cooling + water cooling |

L = mechanical length (optical length + 32 mm)

EFFILUX offers the cooling system adapted to the lighting power and the environment in which it is integrated.
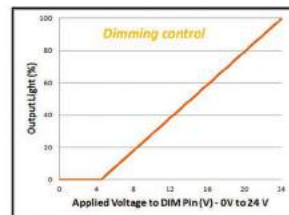
ⓘ Contact EFFILUX for any CAD request.

- Electronical configurations

EFFI-Line is powered by a 24V DC source.

By using the DIM pin, the luminous intensity may be increased in a linear way :

- 0V - OFF
- 24V – Full ON

Dimming control

> Connectivity

EFFI-Line connector

Pin number	Cable number	Designation
1	1	+24V
2	2	DIM – max 24V
3	3	GND
4	Yellow / Green	n.a.

EFFI-Line Power connector

Pin number	Cable number	Designation
1	brown	+24V
2	blue	GND
3	black	DIM – max 24V

Projector

EFFI-Sharp powerful and homogeneous projector

- Description

EFFI-Sharp is a LED projector producing **very powerful and focused beams**. It projects shapes such as **discs** or **squares** (or custom shape) to illuminate objects **at short or long distance** from 20 mm to 2 m.

The **FocusLight** version allows to focus the beam for **a short working distance**, providing **a very intense lighting**.

The **Power** version emits **a light beam 2.5 times more powerful** than EFFI-Sharp. The EFFI-Sharp Power features allow it to illuminate objects at large working distance.

The **Focuslight Power** includes EFFI-Sharp Focuslight and EFFI-Sharp Power features.

- Applications

• *Quality control*

• *Surface defects detection*

• *Contour defects detection*
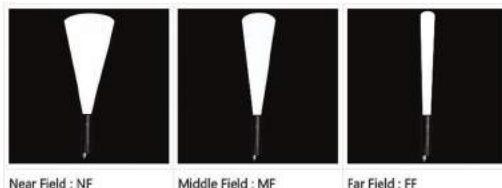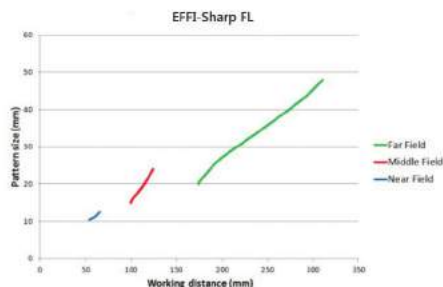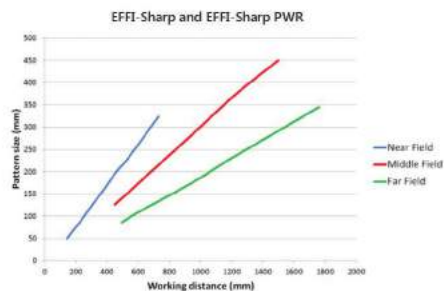
• *Color identification*

• *...*
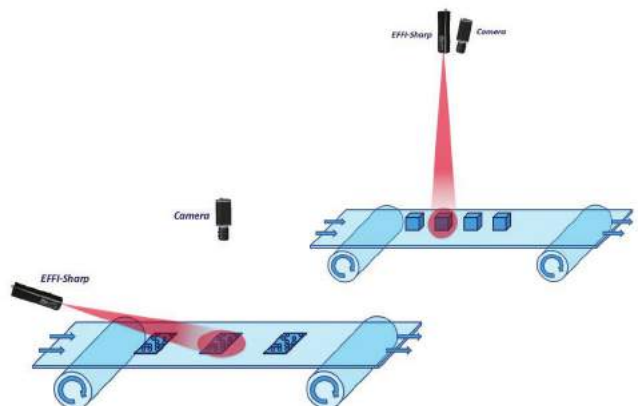
EFFI-Sharp powerful and homogeneous projector

- Optical configurations

> Versions, working distances and objectives

	EFFI-Sharp		EFFI-Sharp PWR		EFFI-Sharp FL	
XX : objective	Typical working distance (mm)	Illuminance	Typical working distance (mm)	Illuminance	Typical working distance (mm)	Illuminance
Near Field (NF)	100 - 800	100 000 Lux at 100 mm	100 - 800	250 000 Lux at 100 mm	40 - 70	1 000 000 Lux at 50 mm
Middle Field (MF)	400 - 1600	5000 Lux at 500 mm	400 - 1600	12 500 Lux at 500 mm	80 - 120	300 000 Lux at 100 mm
Far Field (FF)	500 - 1800	650 Lux at 2000 mm	500 - 1800	1500 Lux at 2000 mm	150 - 300	150 000 Lux at 180 mm
CM			To adjust a C-mount objective. *To choose your objective, refer to the datasheet.*			

Versions

EFFI-Sharp and EFFI-Sharp PWR

EFFI-Sharp FL

EFFI-Sharp

EFFI-Sharp PWR
More powerful

EFFI-Sharp FL
More focused

EFFI-Sharp FL PWR
More powerful and more focused

Near Field : NF

Middle Field : MF

Far Field : FF

Part numbers :
Standard : EFFI-SHARP-**XX**...
Power : EFFI-SHARP-**PWR**-**XX**...
Focuslight : EFFI-SHARP-**FL**-**XX**...
Focuslight Power : EFFI-SHARP-**FL**-**PWR**-**XX**

> Available wavelengths

Color	● UV 365	● UV	● Blue	● Green	● Red	● IR	○ White (T°= 5500 K ± 500 K)
YYY : wavelength (nm)	365	405	465	525	625	850	000

Part numbers :
Standard : EFFI-SHARP-XX-**YYY**...
Power : EFFI-SHARP-**PWR**-XX-**YYY**...
Focuslight : EFFI-SHARP-**FL**-XX-**YYY**...
Focuslight Power : EFFI-SHARP-**FL**-**PWR**-XX-**YYY**

EFFI-Sharp powerful and homogeneous projector

> Shapes projection

Shape	Z : shape number	Masks dimensions
⬤	1	9x9 mm
⬤	2	Ø15.1 mm
⬤	3	R = 9.5 mm

Part numbers :
Standard : EFFI-SHARP-XX-YYY-Z
Power : EFFI-SHARP-**PWR**-XX-YYY-Z
Focuslight : EFFI-SHARP-**FL**-XX-YYY-Z
Focuslight Power : EFFI-SHARP-**FL**-**PWR**-XX-YYY-Z

Z : 1, 2 or 3
For custom shape, please contact us.

> Polarizer

The optical accessory Polarizer removes glare caused by the lighting on parts to control. The camera can then analyze the part, without being disturbed by the glow effects.

Without polarizer

With polarizer

Part numbers :
Standard : EFFI-SHARP-XX-YYY-Z-**POL**
Power : EFFI-SHARP-**PWR**-XX-YYY-Z-**POL**
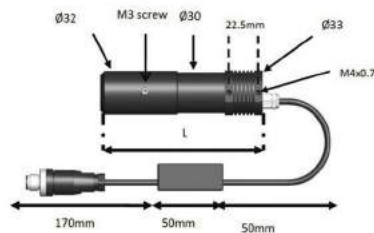*Focuslight* : EFFI-SHARP-**FL**-XX-YYY-Z-**POL**
Focuslight Power : EFFI-SHARP-**FL**-**PWR**-XX-YYY-Z-**POL**

POL : polarizer accessory
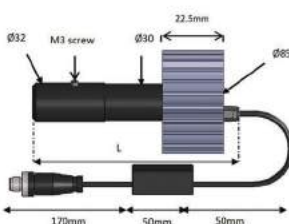*If polarizer, add -POL in the part number*
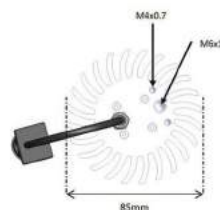
- Mechanical configurations

> EFFI-Sharp

	Min L	Max L
EFFI-Sharp NF	110 mm	120 mm
EFFI-Sharp MF	116 mm	132 mm
EFFI-Sharp FF	132 mm	166 mm

> EFFI-Sharp PWR

	Min L	Max L
EFFI-Sharp PWR NF	144 mm	154 mm
EFFI-Sharp PWR MF	149 mm	165 mm
EFFI-Sharp PWR FF	166 mm	200 mm

EFFI-Sharp powerful and homogeneous projector

> EFFI-Sharp FL

	Min L	Max L
EFFI-Sharp FL NF	163 mm	173 mm
EFFI-Sharp FL MF	168 mm	173 mm
EFFI-Sharp FL FF	185 mm	219 mm

- Electronical configurations
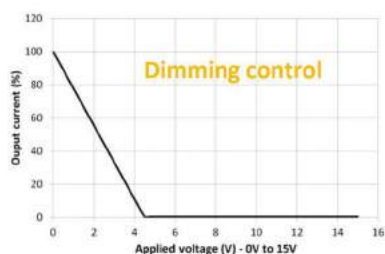
Electronic steering choices

Standard mode : M12 - internal driver
Expert mode : M8 - direct control

> Connectivity

M12 connector (standard mode)

EFFI-Sharp, EFFI-Sharp FL and EFFI-Sharp PWR are powered by a constant voltage 24V with EFFI-Supply cable (attached to the projector).

Pin number	Cable color	Designation
1	brown	+24V
2	white	n.a.
3	blue	GND
4	black	DIM - max 15V

⚠ M8 connector - direct control (expert mode)

A current source can be used to power EFFI-Sharp, EFFI-Sharp FL and EFFI-Sharp PWR in pulsed mode : contact us for more information.

Pin number	Cable color	Designation
1	brown	n.a.
2	blue	+
3	black	GND

⚠ In expert mode, the LED is wired directly to the M8 : no protection for the LED !

EFFI-Sharp V2 High power projector of patterns

Auto-strobe version
available

- Description

EFFI-Sharp V2 is the new projector with high power LED EFFILUX. It projects **discs** or **squares** (or custom shapes) to illuminate **short or long distance** objects from 20 mm to 2 m.

Compared to its predecessor EFFI-Sharp, it offers **power up to 15 times higher** and a simplified lens adjustment system.

There are 3 **versions of EFFI-Sharp V2** offering for each different optical, mechanical and electronic characteristics depending on customer needs.

- **Compact** version (standard) : EFFI-Sharp V2 Compact
- Version with **passive cooling** : EFFI-Sharp V2 Passive
- Version with **fan** : EFFI-Sharp V2 Fan.

- Applications

• *Quality Control*

• *Surface defects detection*

• *Edge detection*

• *Color identification*

• *...*

EFFI-HBF LED spot

- Description

EFFI-HBF * is a LED lighting that replaces halogen light sources. It is designed for a range of applications : alignment, macro inspection, spot lighting.... Its advantages are its small size, long lifetime and low power consumption.

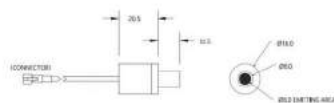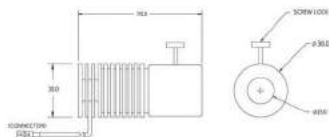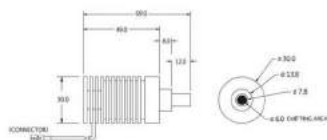* Available for France, Germany and Switzerland

- Part number

EFFI-HBF-00-08-1-X-5V

EFFI-HBF-00-16-1-X-5V

EFFI-HBFS-00-08-1-X-5V

Part number	Color (X)	Voltage / Power	Current
EFFI-HBF-00-08-1-X-5V	● ● ● ○	5V / 3W	600mA
EFFI-HBF-00-16-1-X-5V	● ● ● ○	5V / 3W	600mA
EFFI-HBFS-00-08-1-X-5V	● ● ● ○	5V / 0.5W	100mA

3D projector

EFFI-Lase structured LED lighting

- Description

EFFI-Lase is **a structured LED lighting**. It projects **powerful and accurate patterns** such as : line, cross, cloud of dots... Designed for **3D reconstruction, stereovision and alignment** applications, EFFI-Lase has the **same quality as a laser beam** (precise, powerful, homogeneous) and **removing any speckle problem**.
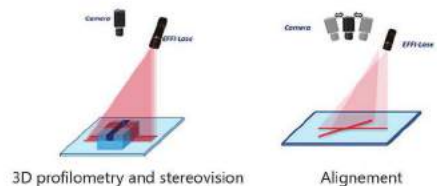
EFFI-Lase Power is a structured LED lighting using standard EFFI-Lase features but emitting a light beam amount **2.5 times more powerful.**

Advantages VS laser :

* *NO SPECKLE : more accurate*
* *Eye safety*
* *Compatible C-mount objective*
* *Several standard masks*
* *Homogeneity > 80 %*

- Applications

* *3D profilometry*

* *Stereovision*

* *Alignement*

3D profilometry and stereovision

Alignement

3D projector EFFILUX (on top) VS Laser (below) : no speckle so more accurate

EFFI-Lase structured LED lighting

- Optical configurations

> Available wavelengths

Color	● UV 365	● UV	● Blue	● Green	● Red	● IR	○ White (T°= 5500 K ± 500 K)
YYY : wavelength (nm)	365	405	465	525	625	850	000

Part numbers :
Standard : EFFI-LASE-CM-YYY...
Power : EFFI-LASE-PWR-CM-YYY...

> Masks

3D profilometry

Mask										
ZZZ : part number mask	L01	L02	L03	L04	L05	L06	L07	L08	L09	L41
Designation	1 line 50µm	1 line 20µm	1 line 10µm	3 lines 50µm	3 lines 50µm	5 lines 50µm	100 lines 45µm	22 lines 50µm	1 line 5µm	1 line 75µm 40 lines 45µm
Line length (mm)	13	13	13	13	13	13	13	13	13	13
Step between each line (µm)	/	/	/	500	200	750	67,5		/	

Stereovision

Mask							
ZZZ : part number mask	G01	G02	G03	G04	G05	C02	C03
Designation	Round Ø50µm	Round Ø50µm	Grid 40*40 lines 50µm	Grid 50*50 lines 50µm	Square 50*50µm²	Cloud of dots density 50%	Cloud of dots density 17%
Pattern surface (mm²)	10x10	13x13	10x10	13x13	10x10	12,8x9,6	12,8x9,6
Step between each pattern (µm)	50	50	50	50	100	/	/

Alignement

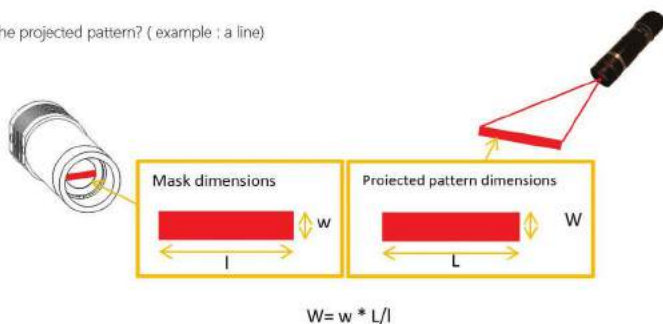| Mask			
ZZZ : part number mask	A01	A02	A03
Designation	Cross 50µm	Concentric circles	Square 50µm
Line length (mm)	13		10

Part numbers :
Standard : EFFI-LASE-CM-YYY-ZZZ
Power : EFFI-LASE-PWR-CM-YYY-ZZZ

Possibility to buy only the mask

EFFI-Lase structured LED lighting

How to calculate the size of the projected pattern? (example : a line)

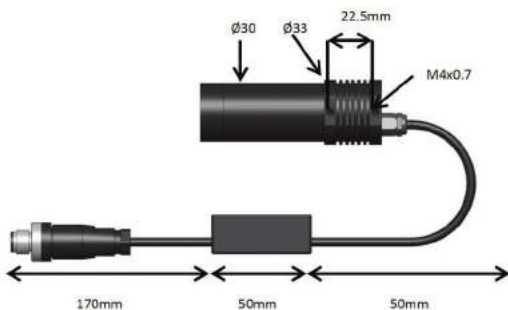| Mask dimensions	Projected pattern dimensions

$$W = w * L/l$$

> C-mount objectives

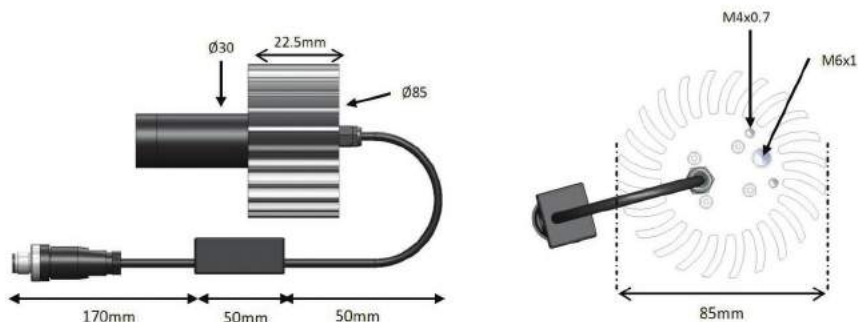(i) EFFILUX recommends to use an objective for 1 inch sensor for large masks, such as clouds of dots.

The objectives are not included with the projectors. EFFI-Lase is equipped with a C-mount (M25.5). Contact us if necessary.
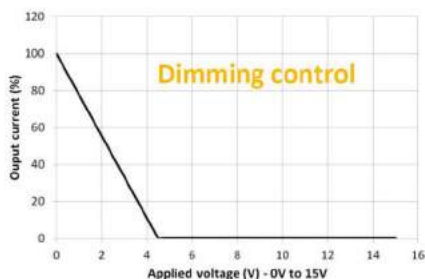
- Mechanical configurations

> EFFI-Lase

> EFFI-Lase Power

EFFI-Lase structured LED lighting

- Electronical configurations

Dimming control
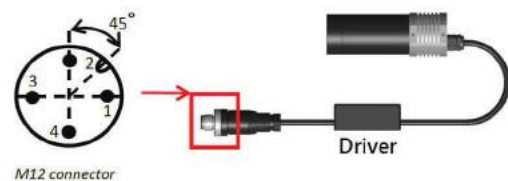
Electronic steering choices

Standard mode : M12 - internal driver
Expert mode : M8 - direct control

## > Connectivity

M12 connector (standard mode)

EFFI-Lase and EFFI-Lase Power are powered by a constant voltage 24V with EFFI-Supply cable (attached to the projector).

M12 connector

Driver

Pin number	Cable color	Designation
1	brown	+24V
2	white	n.a.
3	blue	GND
4	black	DIM - max 15V

⚠ M8 connector - direct control (expert mode)

A current source can be used to power EFFI-Lase and EFFI-Lase Power in pulsed mode : contact us for more information.
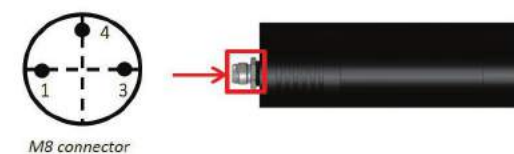
M8 connector

Pin number	Cable color	Designation
1	brown	n.a.
2	blue	+
3	black	GND

⚠ In expert mode, the LED is wired directly to the M8 : no protection for the LED !

ⓘ Possibility to buy only the EFFI-Supply cable, part number : EFFI-SUPPLY-WIRE.

EFFI-Lase V2 structured lighting with interchangeable masks

Auto-strobe version available

- Description

EFFI-Lase V2 is the new structured LED lighting. It is designed for **3D reconstruction, stereovision and alignment applications**. It projects **powerful and finesse motives** such as : **line, cross, cloud of dots...** Compared to its predecessor EFFI-Lase, it is **6 to 15 times more powerful** * and it allows to direct and to **interchange masks** easily.

There are **3 versions of EFFI-Lase V2** offering for each different optical, mechanical and electronic characteristics depending on customer needs.

- **Compact** version (standard) : **EFFI-Lase V2 Compact**
- Version **with passive cooling** : **EFFI-Lase V2 Passive**
- Version **with fan** : **EFFI-Sharp V2 Fan.**

* *Depending on the chosen LED card*

Advantages VS laser :

- *NO SPECKLE : more accurate*
- *Eye safety*
- *Compatible C-mount objective*
- *Several standard masks*
- *Homogeneity > 80 %*

- Applications

- *3D profilometry*

- *Stereovision*

- *Alignement*

EFFI-Lase V2 structured lighting with interchangeable masks

- Optical configurations

> Available wavelengths

Color	● Ultraviolet 365	● Ultraviolet	● Blue	● Green	● Red	● IR	○ White (T° = 5500 K ± 500 K)
XXX : wavelength (nm)	365	405	465	525	625	850	000

Part numbers :
Compact : EFFI-LASE-**CPT**-**XXX**...
Passive : EFFI-LASE-**PSV**-**XXX**...
Fan : EFFI-LASE-**FAN**-**XXX**...

> LED cards *

Card			
	Line LED	Square LED	Square LED - 3 drivers
YYY : part number card	LX1	MX1	MX3

Part numbers :
Compact : EFFI-LASE-**CPT**-**XXX**-**YYY**...
Passive : EFFI-LASE-**PSV**-**XXX**-**YYY**...
Fan : EFFI-LASE-**FAN**-**XXX**-**YYY**...
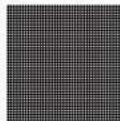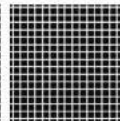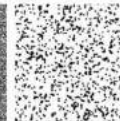
* Depending on the pattern to be projected

> Masks

3D profilometry

Mask										
ZZZ : part number mask	L01	L02	L03	L04	L05	L06	L07	L08	L09	L41
Designation	1 line 50µm	1 line 20µm	1 line 10µm	3 lines 50µm	3 lines 50µm	5 lines 50µm	100 lines 45µm	22 lines 50µm	1 line 5µm	1 line 75µm 40 lines 45µm
Line length (mm)	13	13	13	13	13	13	13	13	13	13
Step between each line (µm)	/	/	/	500	200	750	67,5		/	

Stereovision

Mask							
ZZZ : part number mask	G01	G02	G03	G04	G05	C02	C03
Designation	Round Ø 50µm	RoundØ 50µm	Grid 40*40 lines 50µm	Grid 50*50 lines 50µm	Squares 50x50µm²	Cloud of dots density 50%	Cloud of dots density 17%
Pattern surface (mm²)	10x10	13x13	10x10	13x13	10x10	12,8x9,6	12,8x9,6
Step between each pattern (µm)	50	50	50	50	100	/	/

EFFI-Lase V2 structured lighting with interchangeable masks

Alignement

Mask			
ZZZ : part number mask	A01	A02	A03
Designation	Cross 50µm	Concentric circles	Square 50µm
Line length (mm)	13	/	10

Part numbers :
Compact : EFFI-LASE-CPT-XXX-YYY-ZZZ
Passive : EFFI-LASE-PSV-XXX-YYY-ZZZ
Fan : EFFI-LASE-FAN-XXX-YYY-ZZZ

Possibility to buy only the mask

> How to change the mask ?

1) Spanner wrench *

2) Unscrew the ring

3) Remove the ring

4) Change the mask

5) Interpose the ring

6) Screw the ring

* Possibility to buy an EFFILUX spanner wrench

How to calculate the size of the projected pattern? (Example : a line)
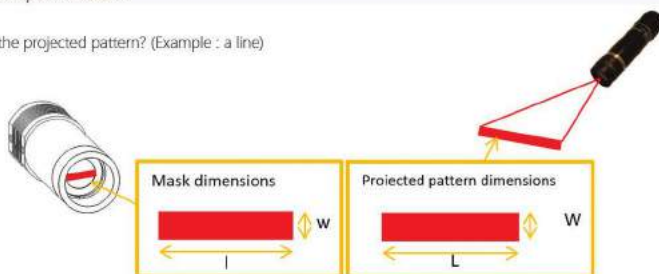
Mask dimensions

w

l

Projected pattern dimensions

W

L

$$W = w * L/l$$

> C-mount objectives

(i) EFFILUX recommends to use an objective for 1 inch sensor for large masks, such as clouds of dots.

The objectives are not included with the projectors. EFFI-Lase is equipped with a C-mount (M25.5). Contact us if necessary.

EFFI-Lase V2 structured lighting with interchangeable masks

- Mechanical configurations

> EFFI-Lase V2 Compact
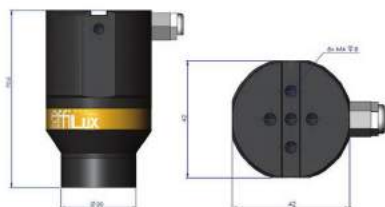
> EFFI-Lase V2 Passive
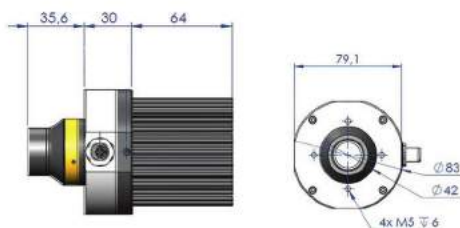
> EFFI-Lase V2 Fan
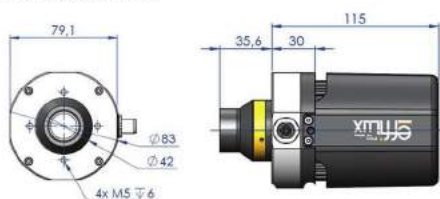
- Electronical configurations

> Driver

	Compact	Passive	Fan
Version			
Driver	No driver : direct control only	Integrated smart driver	Integrated smart driver

> Connectivity

PASSIVE & FAN VERSION:M12   COMPACT VERSION:M8
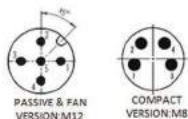
Pin number	Cable color	Compact	Passive & Fan
1	brown	$+V_{common}$	+24V
2	white	Channel 1, GND	NPN : triggering on low state
3	blue	Channel 2, GND	GND
4	black	Channel 3, GND	PNP : triggering on high state
5	Grey	/	AIC (Analog Intensity Control : 0-10V) - max 24V

Analog Intensity Control

0V < U_{AIC} < 2V → LED OFF
2V < U_{AIC} < 10V → ≈20% < I_{LED} < 100%
10V < U_{AIC} < 24V → LED ON 100%
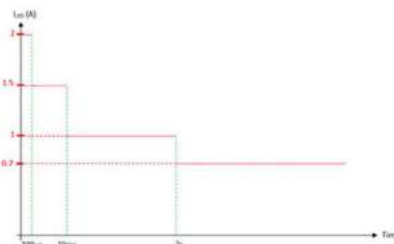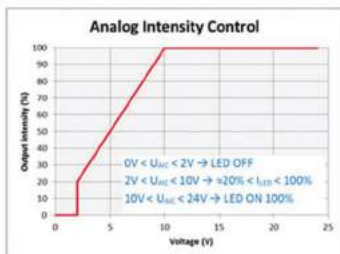
Telecentric

- Description

At the output of a telecentric lighting, the light is **collimated**. The collimated light is **a parrallel structure of light rays** from a point source. The illuminated area and light intensity remain the same whatever the distance.

EFFI-Telecentric is **a telecentric LED lighting** (parallel light at the output) for the **measurement** and **edges detection** of objects with great accuracy. It is used either by **backlighting** or associated with a **coaxial system**.

- Applications

• *Highlighting of reliefs (dings, dents, scratches ...) on flat and reflective surfaces*

• *Edges detection of objects whatever its opacity (no phenomenon of refraction)*

• *...*

Collimated light :
the light rays are parallel

EFFI-Telecentric telecentric LED lighting

- Optical configurations

> Optical length

Designation	Length (mm)	XXX : optical diameter (mm)
EFFI-TELECENTRIC-20	117	20
EFFI-TELECENTRIC-45	147	45
EFFI-TELECENTRIC-70	245	70
EFFI-TELECENTRIC-145	410	145

Part number : EFFI-TELECENTRIC-XXX...

> Available wavelengths

Color	● UV	● Blue	● Green	● Red	● IR	○ White (T°= 5500 K ± 500 K)
YYY : wavelength (nm)	405	465	525	625	850	000

Part number : EFFI-TELECENTRIC-XXX-YYY

- Mechanical configurations

> EFFI-Telecentric 20
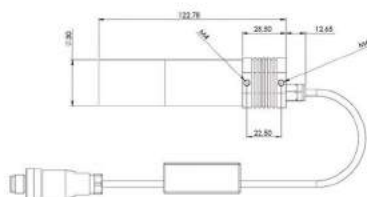
> EFFI-Telecentric 45

> EFFI-Telecentric 70

> EFFI-Telecentric 145 NEW

ⓘ Contact us for any request for information and CAD files.

- Electronical configurations

See electronical page 55

Coaxial

EFFI-CAS coaxial lighting

- Description

EFFI-CAS2 * is a range of **coaxial LED lightings** of **various sizes**.

* Available for France, Germany and Switzerland
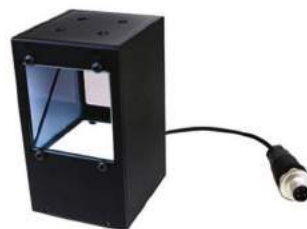
- Applications

- *Surface inspection*
- *Texture inspection*
- *Reflective objects inspection (metal, glass, etc.)*
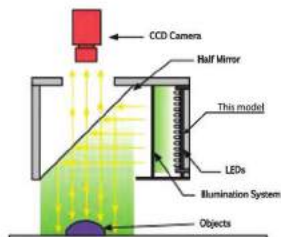
- Part number
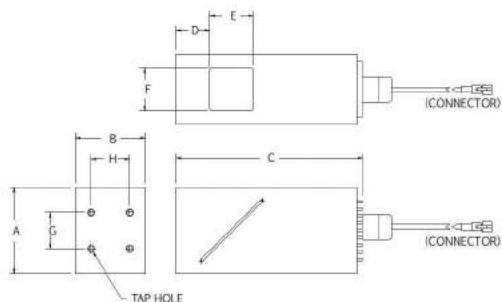
Part number	A (mm)	B (mm)	C (mm)	E (mm)	F (mm)	Color (X)	Voltage / Power	Current
EFFI-CAS2-00-010-X	36	29	77.4	18	18	● ● ● ○	24V / 1.80W 24V / 3.12W	75mA 130mA
EFFI-CAS2-00-020-X	46	39	87.4	25	24	● ● ● ○	24V / 1.92W 24V / 3.60W	80mA 150mA
EFFI-CAS2-00-040-X	66	60	107.4	48	48	● ● ● ○	24V / 3.50W 24V / 8.40W	146mA 350mA
EFFI-CAS2-00-070-X	95	89	139.6	70	70	● ● ● ○	24V / 12.60W 24V / 13.44W	525mA 560mA
EFFI-CAS2-00-0100-X	123.8	120	168.7	100	100	● ● ● ○	24V / 10.80W 24V / 18.74W	450mA 781mA
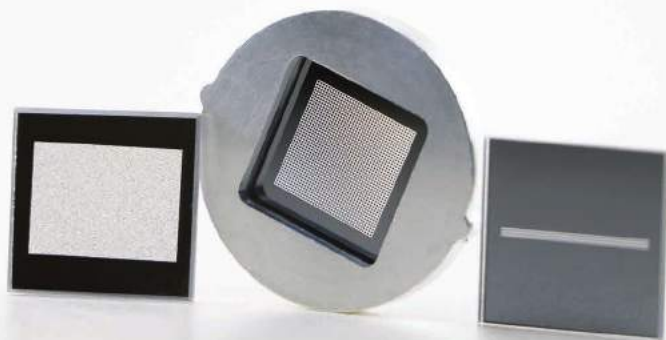
Optical

Electronical

Mechanical

Accessories optical accessories

- Windows

EFFILUX offers **different types of interchangeable windows** to find a good compromise between **power** and **homogeneity** depending on the nature of the object to control.

Transparent   Semi-diffuse   Opaline

+ Powerful ⟵————————————————⟶ + Homogeneous

Window	Transparent	Semi-diffuse	Opaline
EFFI-Flex	Part number : EFFO-FLEX-TR-XX*	Part number : EFFO-FLEX-SD-XX*	Part number : EFFO-FLEX-OP-XX*
EFFI-Ring	Part number: EFFO-RING-TR	Part number : EFFO-RING-SD	Part number : EFFO-RING-OP

- Polarizers

The polarizer **eliminates glare** caused by the lighting on parts to control. The camera can then analyze the part, without being disturbed by the glow effects.

The polarizer can be useful to perform quality control on parts packed in transparent plastic bags

Without polarizer   With polarizer

	EFFI-Flex	EFFI-Ring	Camera	Custom
Picture				
Part number	EFFO-FLEX-POL-XX*	EFFO-RING-POL	Ø25.5 : EFFO-FLR-POL-M25.5 Ø27 : EFFO-FLR-POL-M27 ØXX : EFFO-FLR-POL-MXX	*To put a polarizer in another product, please contact us.*

* XX : Number of LED

Accessories optical accessories

- <u>Filters</u>

EFFILUX offers several color filters : **high-pass**, **low-pass** and **band-pass**, which have the property of transmitting only some determined wavelengths.

Applied directly to the cameras, they suppress the disturbances generated by the ambient light.

STEP UP and STEP DOWN adapters

In stock : SU27-30.5, SD27-25.5, SU25.5-27, SD30.5-27.

Adapter	Part number	Description
SU27-30.5	EFFO-FLR-SU27-30.5	To adapt a M30.5 filter on a M27 camera
SD27-25.5	EFFO-FLR-SD27-25.5	To adapt a M25.5 filter on a M27 camera
SU25.5-27	EFFO-FLR-SU25.5-27	To adapt a M27 filter on a M25.5 camera
SD30.5-27	EFFO-FLR-SD30.5-27	To adapt a M27 filter on a M30.5 camera

> Band-pass

Large (Broad BandPass)

	BP365	BP500	BP505	BP525	BP550	BP590	BP735
Part number	EFFO-FLR-BP365-80-XXX*	EFFO-FLR-BP500-248-XXX*	EFFO-FLR-BP505-90-XXX*	EFFO-FLR-BP525-80-XXX*	EFFO-FLR-BP550-300-XXX*	EFFO-FLR-BP590-70-XXX*	EFFO-FLR-BP735-65-XXX*
Chart (transmission % / wavelength)							
Wavelength (nm)	365	500	505	525	550	590	735
FWHM (nm)	80	248	90	80	300	70	65

Narrow (Narrow BandPass)

	BN470	BN630	BN850
Part number	EFFO-FLR-BN470-50-XXX	EFFO-FLR-BN630-45-XXX	EFFO-FLR-BN850-45-XXX
Chart (transmission % / wavelength)			
Wavelength (nm)	470	630	850
FWHM (nm)	50	45	45

* XXX : filter size (ex : M25.5)

Accessories optical accessories

> High-pass (LongPass)

	LP415	LP470	LP500	LP530	LP580	LP610	LP645	LP695	LP800
Part number	EFFO-FLR-LP415-XXX	EFFO-FLR-LP470-XXX	EFFO-FLR-LP500-XXX	EFFO-FLR-LP530-XXX	EFFO-FLR-LP580-XXX	EFFO-FLR-LP610-XXX	EFFO-FLR-LP645-XXX	EFFO-FLR-LP695-XXX	EFFO-FLR-LP800-XXX
Chart (transmission % / wavelength)									
Wavelength (nm)	415	470	500	530	580	610	645	695	800

* XXX : filter size (ex : M25.5)

> Low-pass (ShortPass)

	SP700
Part number	EFFO-FLR-SP700-XXX
Chart (transmission % / wavelength)	
Wavelength (nm)	700

* XXX : filter size (ex : M25.5)

- Masks

EFFILUX provides a full range of masks compatible with the structured LED lighting EFFI-Lase. Custom masks can be made on request.

- 3D profilometry
- Stereovision
- Alignement

Part number : EFFO-MSK-XXX

> 3D profilometry

Mask										
XXX : mask model	L01	L02	L03	L04	L05	L06	L07	L08	L09	L41
Designation	1 line 50µm	1 line 20µm	1 line 10µm	3 lines 50µm	3 lines 50µm	5 lines 50 µm	100 lines 45µm	22 lines 50µm	1 line 5µm	1 line 75µm 40 lines 45µm
Line length (mm)	13	13	13	13	13	13	13	13	13	13
Step between each line (µm)	/	/	/	500	200	750	67,5		/	

Accessories optical accessories

> Stereovision

Mask							
XXX : mask model	G01	G02	G03	G04	G05	C02	C03
Designation	Round Ø 50µm	Round Ø 50µm	Grid 40*40 lines 50µm	Grid 50*50 lines 50µm	Square 50x50µm²	Cloud of dots density 50%	Cloud of dots density 17%
Pattern surface (mm²)	10x10	13x13	10x10	13x13	10x10	12,8x9,6	12,8x9,6
Step between each pattern (µm)	50µm	50µm	50µm	50µm	100µm	/	/

> Alignement

Mask			
XXX : mask model	A01	A02	A03
Designation	Cross 50µm	Concentric circles	Square 50µm
Line length (mm)	13		10

- Flex-Linescan

Thanks to its optical accessory Flex-Linescan, the led bar EFFI-Flex is transformed into a linear or a darkfield lighting : EFFI-Flex-Linescan.

Configuration

- Transparent window
- Flex-Linescan
- lens up position
- LED
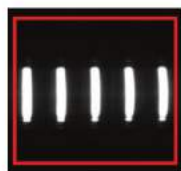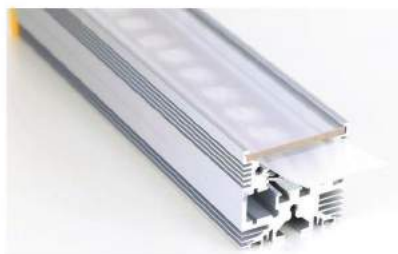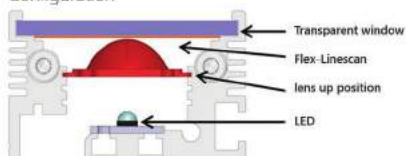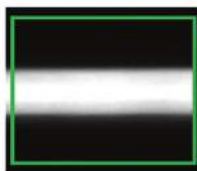
Without Flex-Linescan   With Flex-Linescan

	Flex-Linescan accessory integrated in EFFI-Flex	Flex-Linescan accessory alone
Part number	EFFI-FLEX-WW-XXX-TR-P3-LS*	EFFO-FLEX-LS-WW*

* WW : number of LED
XXX : wavelength (nm)
TR : transparent window
P3 : P3 lens position
"-LS" means that the Flex-Linescan accessory is mounted in the product.

Accessories electronical accessories

- Pulse controller

EFFILUX pulse controllers are designed for high throughput vision applications. They can control the power light to create bright flashes of high intensity that will be synchronized with the camera.

The principle is to feed the high power LED lighting for very short times so as to provide a large amount of light for the acquisition time.

It can control multiple lightings with a single controller (up to 4 channels). The output current can reach up to 1A @ 30V in continuous and 10A @ 200V in strobe mode. In addition, Ethernet and RS232 connectors are available across the range.

Pulse controller	Characteristics
EFFI-IPSC4	4 channels, Ethernet RS232, max. current per channel 10A@200V in pulse mode and 1A@30V in continuous, LxWxH 130x142x56 mm. Response time : 2 µs , minimal pulse length : 2 µs at 10A.

> EFFI-IPSC4 cables

Connectivity	Orientation	Length	Part number	Compatibility
M8 - Female Male - 3 pins	Straight Straight	2 m	EFFC-CAB-M8-SUBD-FM-3-DD-L2	EFFI-Sharp, EFFI-Lase
		5 m	EFFC-CAB-M8-SUBD-FM-3-DD-L5	EFFI-Sharp, EFFI-Lase
		10 m	EFFC-CAB-M8-SUBD-FM-3-DD-L10	EFFI-Sharp, EFFI-Lase
M8 - Female Male- 4 pins	Straight Straight	2 m	EFFC-CAB-M8-SUBD-FM-4-DD-L2	EFFI-Sharp V2, EFFI-Lase V2, EFFI-Ring
		5 m	EFFC-CAB-M8-SUBD-FM-4-DD-L5	EFFI-Sharp V2, EFFI-Lase V2, EFFI-Ring
		10 m	EFFC-CAB-M8-SUBD-FM-4-DD-L10	EFFI-Sharp V2, EFFI-Lase V2, EFFI-Ring
naked cable (order with screw connector)	Straight	2 m	EFFC-CAB-SUBD-M-5-D-L2	Custom
		5 m	EFFC-CAB-SUBD-M-5-D-L5	Custom
		10 m	EFFC-CAB-SUBD-M-5-D-L10	Custom

- Potentiometer

EFFI-Dimmer is the dimmer proposed by EFFILUX. It adjusts the light intensity (via control of DIM) of the following products : EFFI-Flex "ELS" version, EFFI-Flex-BL, EFFI-BL, EFFI-FD, EFFI-Lase, EFFI-Sharp, EFFI-Telecentric, EFFI-Smart, EFFI-Lase V2...

Input : a M12 connector plugged to a 24V DC power supply
Output : choice between the two M12 connectors (depending on the DIM voltage range: 0-5V or 0V-24V) allowing to manage all EFFILUX products.

Potentiometer	Characteristics
EFFI-DIMMER	Electrical power < 96W / 24V@4A
EFFI-DIMMER-PWR	Electrical power < 288W / 24V@12A

Accessories electronical accessories

- Power supplies

EFFILUX offers power supplies compatible with all lighting systems. These boxes can power and control the light intensity of the products by varying the voltage (up to three lightings).

> Custom

On request

Number of connectors, power range, built-in timer...

Part number	Characteristics
EFFE-PWR-050W-24V-102-XX *(June 2016)*	1 channel - M12, 50W / 24V - 2A
EFFE-PWR-050W-24V-302-XX *(June 2016)*	3 channels - M12, 50W / 24V - 2A
EFFE-PWR-200W-24V-102-XX *(June 2016)*	1 channel - M12, 200W / 24V - 8A
EFFE-PWR-200W-24V-112-XX *(June 2016)*	1 channel - M12 PWR, 200W / 24V - 8A
EFFE-PWR-200W-24V-302-XX *(June 2016)*	3 channels - M12, 200W / 24V - 8A

XX (type of outlet) : UK, CH, EU. Other connectivities on request.

- Cables

Connectivity	Orientation	Length	New part number	Compatibility
M8 - Female - 3 pins	Straight	2 m	*EFFC-CAB-M8-F-3-D-L2*	EFFI-Sharp, EFFI-Lase in strobe mode
		5 m	*EFFC-CAB-M8-F-3-D-L5*	EFFI-Sharp, EFFI-Lase in strobe mode
		10 m	*EFFC-CAB-M8-F-3-D-L10*	EFFI-Sharp, EFFI-Lase in strobe mode
M8 - Female - 4 pins	Straight	2 m	*EFFC-CAB-M8-F-4-D-L2*	EFFI-Ring in strobe mode
		5 m	*EFFC-CAB-M8-F-4-D-L5*	EFFI-Ring in strobe mode
		10 m	*EFFC-CAB-M8-F-4-D-L10*	EFFI-Ring in strobe mode
M12 - Female - 4 pins	Straight	2 m	*EFFC-CAB-M12-F-4-D-L2*	All products except EFFI-Ring, new products*
		5 m	*EFFC-CAB-M12-F-4-D-L5*	All products except EFFI-Ring, new products*
		10 m	*EFFC-CAB-M12-F-4-D-L10*	All products except EFFI-Ring, new products*
M12 Power - Female - 4 pins	Straight	2 m	*EFFC-CAB-M12P-F-4-D-L2*	All products except EFFI-Ring, new products*
		5 m	*EFFC-CAB-M12P-F-4-D-L5*	All products except EFFI-Ring, new products*
		10 m	*EFFC-CAB-M12P-F-4-D-L10*	All products except EFFI-Ring, new products*
M12 - Female - 5 pins	Straight	2 m	*EFFC-CAB-M12-F-5-D-L2*	EFFI-Ring, new products*
		5 m	*EFFC-CAB-M12-F-5-D-L5*	EFFI-Ring, new products*
		10 m	*EFFC-CAB-M12-F-5-D-L10*	EFFI-Ring, new products*
		10 m	*EFFC-CAB-M12-F-5-D-L10*	EFFI-Ring, new products*
M12 - Female Male - 5 pins	Straight Straight	2 m	*EFFC-CAB-M12-FM-5-DD-L2*	EFFI-Ring, new products*
		5 m	*EFFC-CAB-M12-FM-5-DD-L2*	EFFI-Ring, new products*
		10 m	*EFFC-CAB-M12-FM-5-DD-L2*	EFFI-Ring, new products*
RD24 - Female - 4 pins	Straight	2 m	*EFFC-CAB-RD24-F-4-D-L2*	EFFI-Line
		10 m	*EFFC-CAB-RD24-F-4-D-L10*	EFFI-Line
	Angled	2 m	*EFFC-CAB-RD24-F-4-C-L2*	EFFI-Line
RD24 - Male - 4 pins	Straight	2 m	*EFFC-CAB-RD24-M-4-D-L2*	EFFI-Line

* EFFI-Smart, EFFI-Lase V2, EFFI-Sharp V2

> Custom

On request

Connectivity, number of pins, length...

Accessories mechanical accessories

- Cameras fixings

EFFILUX offers camera mounting brackets for combining EFFI-FD light or EFFI-Ring with a camera.

Compatible camera models :

- Basler : Ace Series, Pilot Series, Scout Series
- Cognex : Insight 5000 Serie, Insight 7000 Series, Insight Micro
- Datalogic : A30 Series, T4x Series, M1xx Series, M2xx Series, M3xx Series
- IDS : UI-5220 CP, UI-1120 SE, UI-1220 RE, UI-3220 CP, UI-5120 SE, UI-5120 RE
- Matrox : Gator EYE, Iris GT
- Another camera ? Contact us.

	Part 1	Part 2	Part 1 + Part 2
Assembly 1	Part number : EFFM-1-0024	Part number : EFFM-1-0025	
Assembly 2	Part number : EFFM-1-0024	Part number : EFFM-1-0026	

- Lightings fixings

Fixing	Part number	Characteristics	Compatibility
T-Nut	EFFV-BOLT-0011	T-Nut to insert in the product slot. Delivered with a screw M6x14.	EFFI-BL, EFFI-FD, EFFI-Flex
Bracket	Without groove : EFFM-1-0017 1 groove : EFFM-1-0019 2 grooves : EFFM-1-0021	This fixing is fixed in the product profile with a T-Nut and the desired mechanical support via a second T-Nut. Delivered with two screws M6x14, two T-Nuts EFFV-BOLT-0011 and two washers.	EFFI-BL, EFFI-FD, EFFI-Flex
"Elcom" ball	Drilled : EFFM-1-0009 NOT drilled : EFFM-1-0002	Drilled : this ball can be attached to products using the two M4 holes. Supplied with two screws M4x12, a screw M6x14 and a T-Nut EFFV-BOLT-0011. NOT drilled : this attachment can also be used to attach the following products by screwing into the section through the central hole. Delivered with a T-Nut EFFV-Bolt-0011 and two screws M6x14.	Drilled : EFFI-Sharp (on EFFI-Sharp Power, the ball joint is fixed on the rear of the heatsink), EFFI-Lase, EFFI-Telecentric NOT drilled : EFFI-BL, EFFI-FD, EFFI-Flex
Clamping flange on the body	EFFM-1-0001 (anciennement EFFI-Clamp)	The clamp grips the round body of EFFI-Sharp. 2 fastener configurations are possible. Delivered with two screws M4x20.	EFFI-Sharp, EFFI-Lase, EFFI-Telecentric
Fixation for dome	EFFI-IDS3-00-XX-BRACKET		EFFI-IDS

UWAVE
INNOVATIVE LED UV SYSTEMS

Expert in the UV LED light sources for adhesives, resins, varnishes and inks drying applications.

- Presentation

UWAVE designs and sells **high power UV LED sources** for adhesive, resins, varnishes and inks curing applications in industrial environments.

UWAVE consolidates the presence of EFFILUX in the worldwide industry with its expertise in the integration of high power UV LED lighting systems. As an EFFILUX's spin-off, it adapts existing skills in Engineering (optics, mechanics, etc.) for the **polymerization** or simply **UV drying** market.

UWAVE offers different **efficient standard product ranges** to meet different market applications. In parallel, it designs, prototypes and manufactures UV LED lighting tailored for **OEMs** and **special machinery manufacturers**. Its speed, flexibility and technical expertise make UWAVE a key partner in the success of your projects using high power UV LED lighting.

UWAVE innovative UV LED lighting systems

- Applications

LED UV drying systems for industrial processes in optics, electronics or areas of photonics.

LED UV drying systems for medical or industrial use bonding and sealing.

UV LED printing for screen printing, offset, flexo and digital.

UV coatings for industrial applications. Coatings for wood and other surfaces.

- Ranges of standard products

UV SPOTS

Portable UV sources or integrated in robots.
UV Spots helpful for manual or automated use.

UV surfaces

Homogeneous UV sources to dry large areas in the fields of optics, electronics, etc.

UV bars

Linear UV bars prevalent in industrial environments for drying inks, varnishes or UV adhesives.

UWAVE will answer your questions in order to set up the UV equipment for your application.

www.uwave.fr

Annex *specifications definition*

Before contacting us, please consult these technical issues.
They will help you to define your needs.

Optical

• Wavelength ?
• Illumination requirements : how many "Lux" or "mW / cm^2" at a defined working distance ?
• Illuminated area ?
• Homogeneity requirement ?
• For structured lightings : depth of field ? Edge sharpness ?

Mechanical

• Dimensions ?
• Min / max working distance ?
• Cooling system ?
• Fixings ?

Electronical

• Connectors ? (M8 - M12, number of pins, conventions...)
• Power supply ?
• Auto-strobe or continuous ? (if auto-strobe, which duty cycle and maximum pulse time ?)

Environment

• Inspected material ? (size, reflective or not, color...)
• Ambient light around the application ?
• Selected camera ?
• Atmosphere ? Temperature, humidity, dust...

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