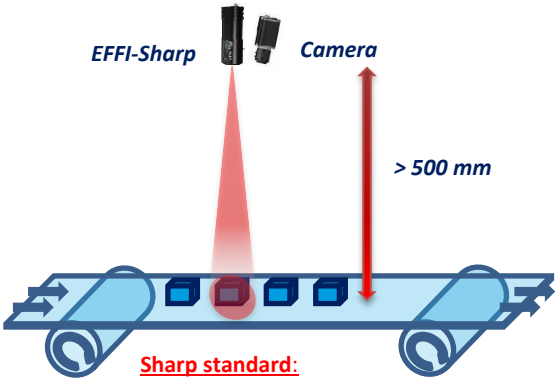
LED Pattern projector

EFFI-Sharp

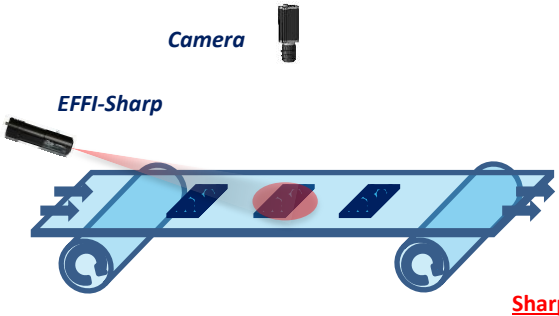
- **Intense** and **homogeneous** spot light
- **Standard** connections and fasteners
- **Flexible:**
  - Adjustable **working distance** [50mm,2000mm]
  - Adjustable **illuminated area** [100mm² ,1m²]
  - Full range of colors: **from UV to IR, white**
  - Various **projected patterns**
- **Long lifetime** and few maintenance

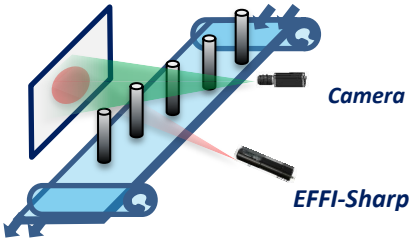
APPLICATIONS:



Sharp standard:
Great distance illumination producing sharp edged spots

Sharp Dark-field:
Tangential illumination for carved codes reading, cleavages inspection, edges view enhancing





Sharp Back-light:
Creation of a backlight illumination going between objects.

OVERVIEW OF THE CHARACTERISTICS

Electronics	*Power supply*	24V DC or constant current
	Illumination mode	Continuous or strobe modes
	Connectors	M12 4 pins or M8 3 pins
	Power consumption	5W
Optics	*Wavelength*	Various wavelengths (from UV to IR, white)
	Projection system	Near Field, Middle Field, Far Field and any C-mount objective
	Projected pattern	Circular, square and custom patterns
Mechanics	*Maximum dimensions*	32mm x 160mm
	Focusing adjustment	A M3 screw on the objective
	Fastener	4 M4 holes on the side of the device
	Material	Device body : Aluminum alloy
Environment	*Working temperature*	0°C to 50°C
	IP code	IP54

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TECHNICAL CHARACTERISTICS

How to create the EFFI-Sharp?

EFFI-Sharp_XX_XXX_X

Objective | Wavelength (nm) | Pattern shape

Near Field: ***NF*** for WD=[100;800]mm
Middle Field: ***MF*** for WD=[400;1600]mm
Far Field: ***FF*** for WD=[500;1800]mm
C-mount: ***CM*** to adjust any C-mount objective

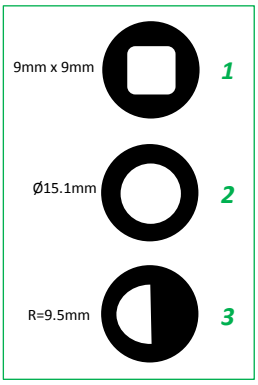
Available wavelengths:

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

Available options:

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

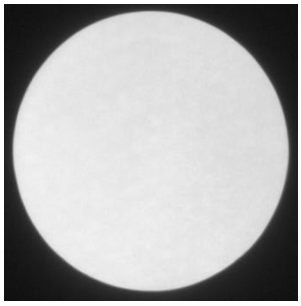
Example: EFFI-Sharp_NF_000_2_P_S



Other wavelengths and patterns are available upon request

Optical characteristics

Uniformity of the pattern

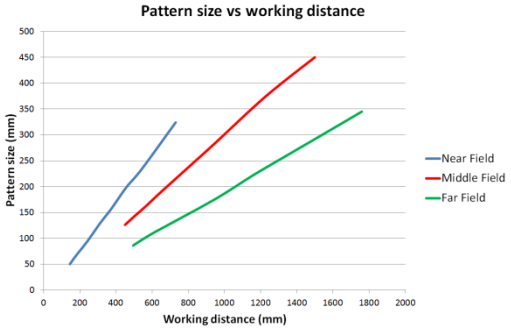


Horizontal profile

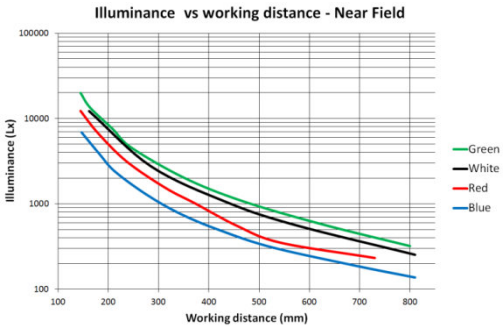
Vertical profile

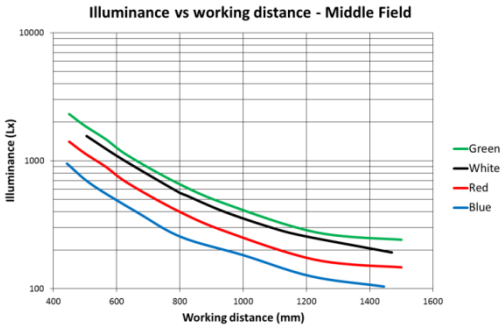
Uniformity larger than 80%

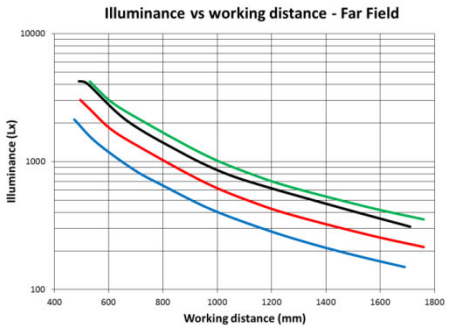
Pattern size and illuminance with the working distance



NB : Measurements achieved with a rounded pattern (Ø15mm)







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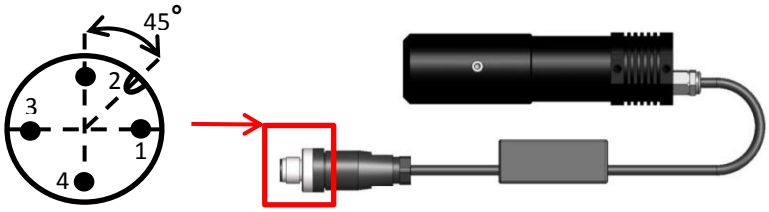
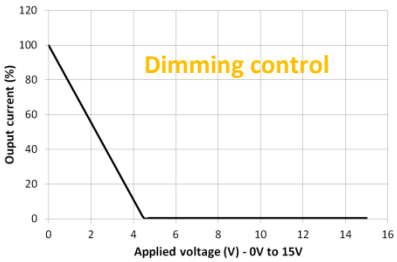
Electrical characteristics

Standard connection

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

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





Make sure that you never exceed the maximum voltage.

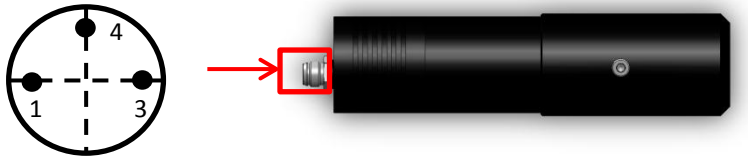
The device is supplied with a 24V (±5%) constant voltage source.

Connection with a current source

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

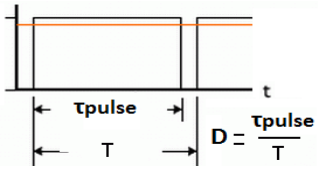
Be aware that the current source option cannot be used with the EFFI-Supply Wire but needs a specific M8 connector.

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



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

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



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

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

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

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

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

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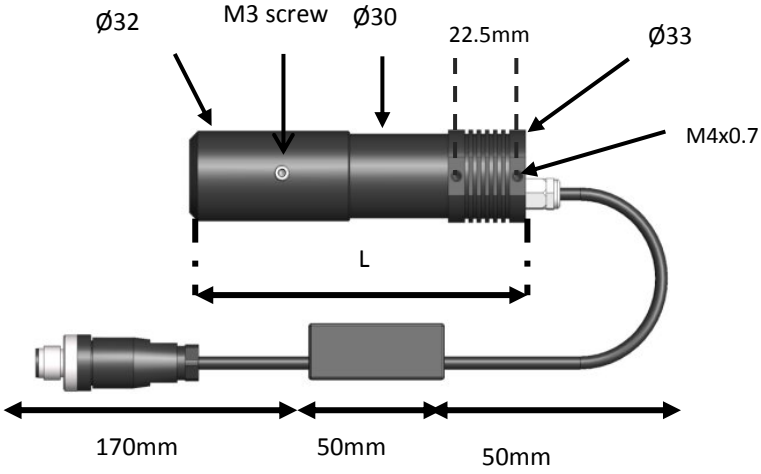
Mechanical considerations

Dimensions



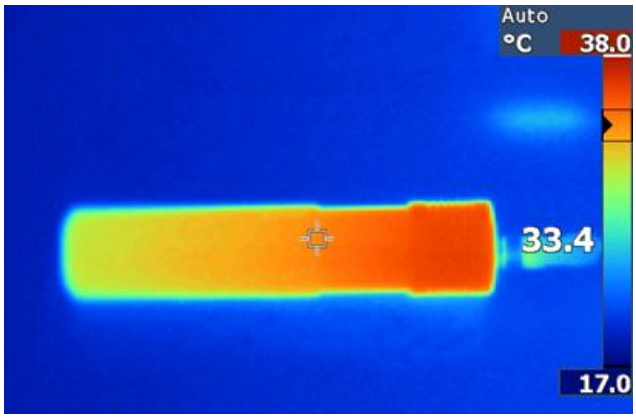
NB: Our accessories can be used to simply your set up.

	Near Field	Middle Field	Far Field
Min L	110mm	116 mm	132mm
Max L	120mm	132 mm	166mm

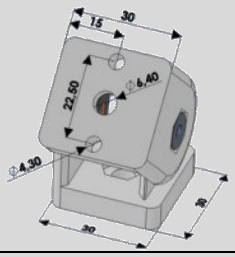
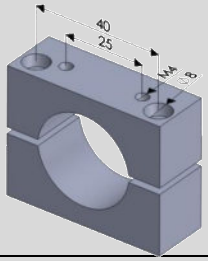
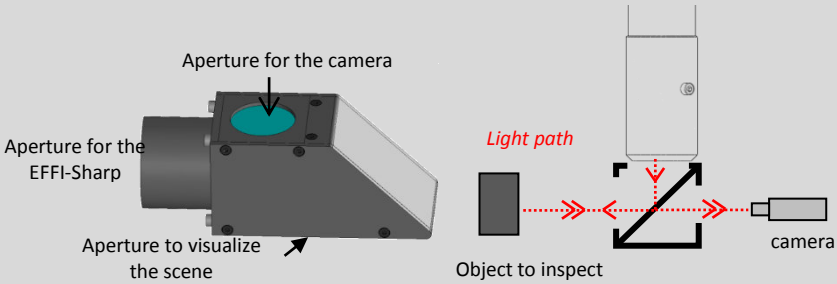
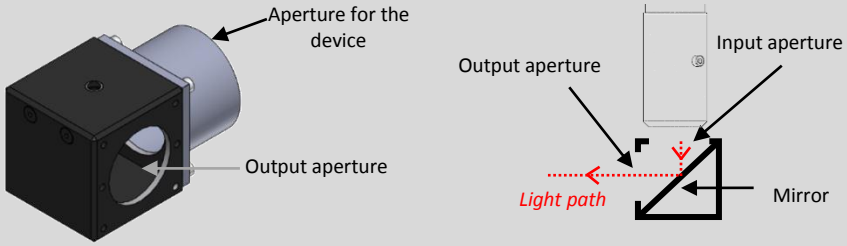
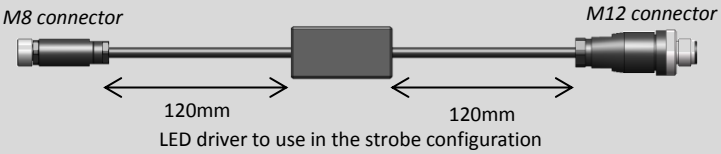
A sharp image is obtained by turning the device's ring in one or another direction until the image is in focus (first, loose carefully the M3 screw present on the objective tube).

Thermal considerations

Thanks to its design, the heat is efficiently dissipated from the LED.



ACCESSORIES

	EFFILUX reference	Description
Mechanics	EFFM_1_0009	Fastener used to simplify the projector integration (orientation) *Delivered with 2 M4x12 screws*  
	EFFM_1_0001	Fastener used to simplify the projector integration *Delivered with 2 M4x20 screws*  
Optics	EFFO-Polariser_0004	Polarizer integrated in the projector to polarize the output light
	EFFO_0007	Coaxial accessory without ghost effect 
	EFFO_0006	Provides a 90° angle between the light source and the illuminated area 
Electronics	EFFC-Cable_M12_0002 Binder: *79 3430 13 04*	M12 cable, 4 pins, 2000mm long
	EFFC-Cable_M12_0003 Binder: *79 3430 17 04*	M12 cable, 4 pins, 5000mm long
	EFFC-Cable_M12_0004 Binder: *79 3430 30 04*	M12 cable, 4 pins, 10000mm long
	EFFC-Cable_M12_0025 Phoenix : *1456938*	M12 cable, 4 pins, High-Flex, 1500mm long
	EFFC-Cable_M12_0026 Phoenix : *1456941*	M12 cable, 4 pins, High-Flex, 3000mm long
	EFFE-Comp_0006	 LED driver to use in the strobe configuration

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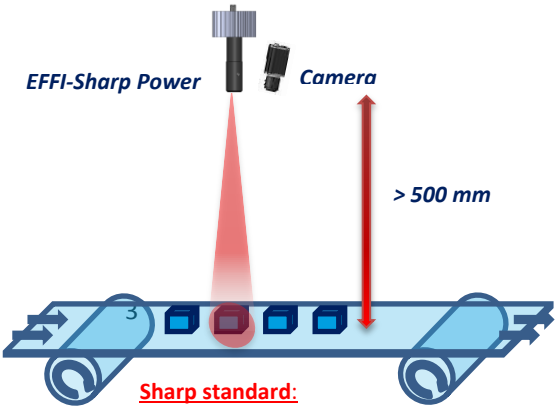
LED Pattern projector

EFFI-Sharp Power

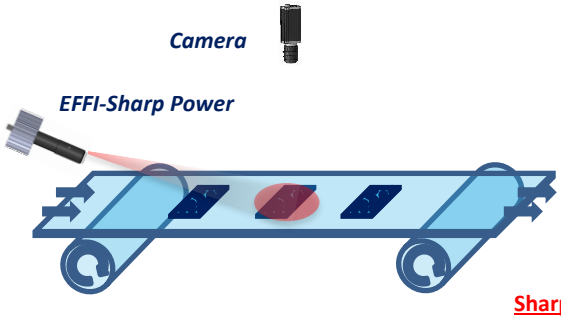
- **Intense** and **homogeneous** spot light
- **Standard** connections and fasteners
- **Flexible:**
  - Adjustable **working distance** [50mm,2000mm]
  - Adjustable **illuminated area** [100mm² ,1m²]
  - Full range of colors: **from UV to IR, white**
  - Various **projected patterns**
- **Long lifetime** and few maintenance

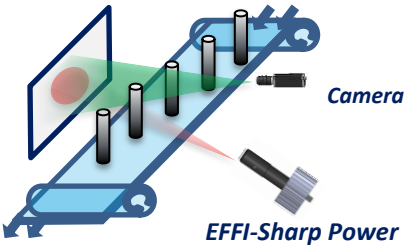
APPLICATIONS:



Sharp standard:
Great distance illumination producing sharp edged spots

Sharp Dark-field:
Tangential illumination for carved codes reading, cleavages inspection, edges view enhancing





Sharp Back-light:
Creation of a backlight illumination going between objects.

OVERVIEW OF THE CHARACTERISTICS

Electronics	*Power supply*	24V DC or constant current
	Illumination mode	Continuous or strobe modes
	Connectors	M12 4 pins or M8 3pins
	Power consumption	15W
Optics	*Wavelength*	Various wavelengths (from UV to IR, white)
	Projection system	Near Field, Middle Field, Far Field and any C-mount objective
	Projected pattern	Circular, square and custom patterns
Mechanics	*Maximum dimensions*	85mm x 200mm
	Focusing adjustment	A M3 screw on the objective
	Fastener	2 M4 holes and 1 M6 hole on the backside of the device
	Material	Device body : Aluminum alloy
Environment	*Working temperature*	0°C to 50°C
	IP code	IP54

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TECHNICAL CHARACTERISTICS

How to create the EFFI-Sharp Power?

EFFI-Sharp_Power_XX_XXX_X

Objective

Wavelength (nm)

Pattern shape

Near Field: ***NF*** for WD=[100;800]mm

Middle Field: ***MF*** for WD=[400;1600]mm

Far Field: ***FF*** for WD=[500;1800]mm

C-mount: ***CM*** to adjust any C-mount objective

Available options:

1. Add a'P' to integrate a polarizer
2. Add a 'S' to strobe the device

Example: EFFI-Sharp_NF_000_2_P_S

Available wavelengths:

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

9mm x 9mm — ***1***

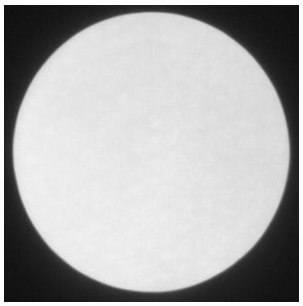
Ø15.1mm — ***2***

R=9.5mm — ***3***

Other wavelengths and patterns are available upon request

Optical characteristics

Uniformity of the pattern

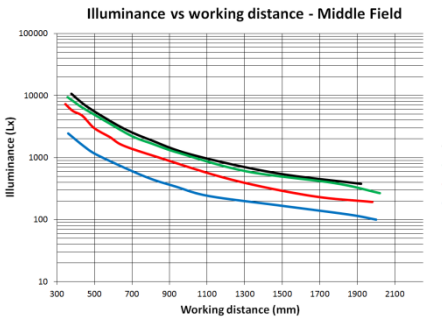


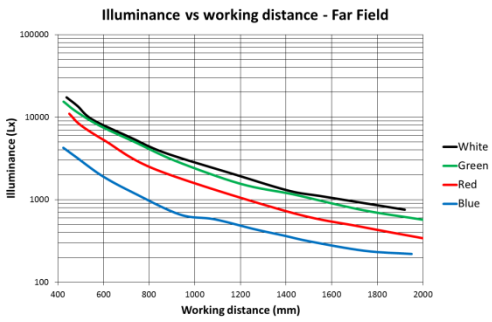
Horizontal profile

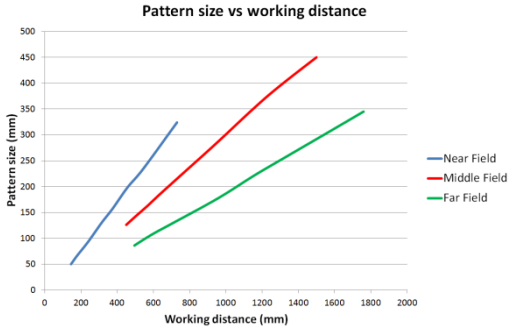
Vertical profile

Uniformity larger than 80%

Pattern size and illuminance with the working distance







NB : Measurements achieved with a rounded pattern (Ø=15mm)

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Efficient Led Lighting

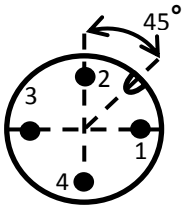
CE RoHS

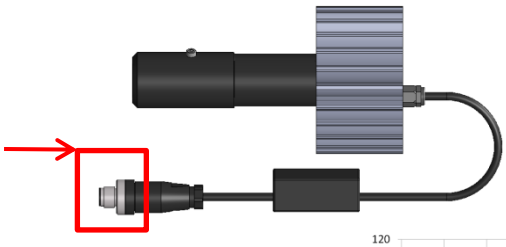
Electrical characteristics

Standard connection

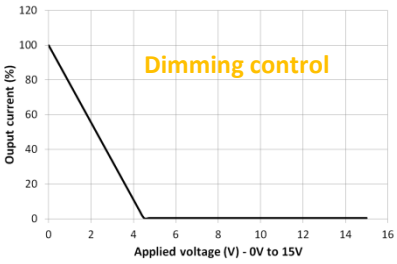
The EFFI-Sharp Power is supplied using the EFFI-Supply Wire (bolted on the projector) and a 24V constant voltage.

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





M12 connector



Make sure that you never exceed the maximum voltage.

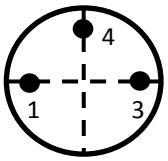
The device is supplied with a 24V (±5%) constant voltage source.

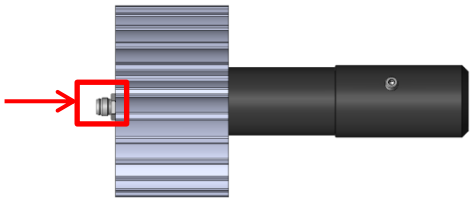
Connection with a current source

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

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

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

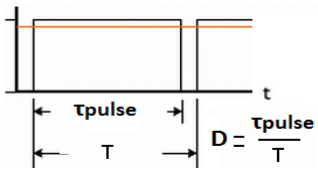




M8 connector

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

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



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

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

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

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

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

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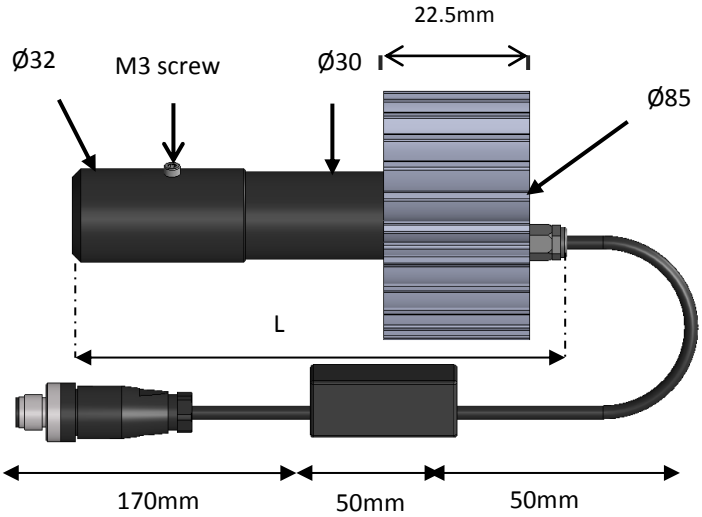
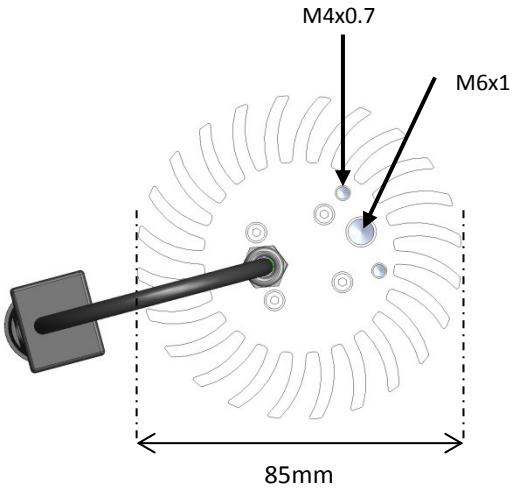
Mechanical considerations

Dimensions





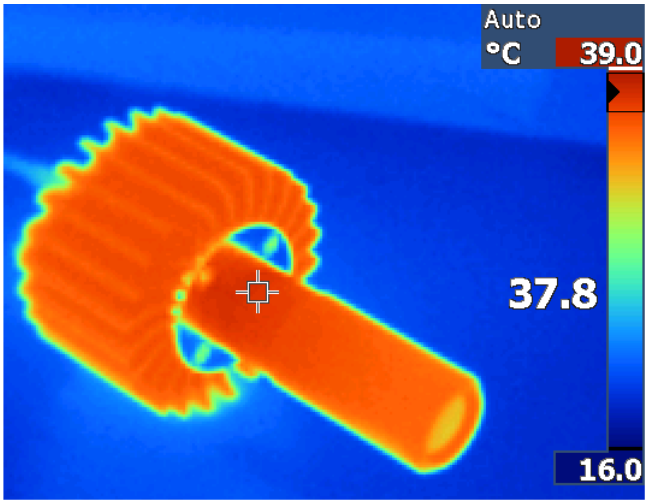
	Near Field	Middle Field	Far Field
Min L	144mm	149mm	166mm
Max L	154mm	165mm	200mm

NB: Our accessories can be used to simply your set up.

A sharp image is obtained by turning the device's ring in one or another direction until the image is in focus (first, loose carefully the M3 screw present on the objective tube).

Thermal considerations

Thanks to its design, the heat is efficiently dissipated from the LED.



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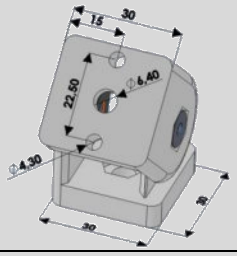
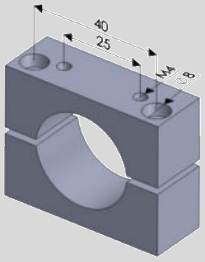
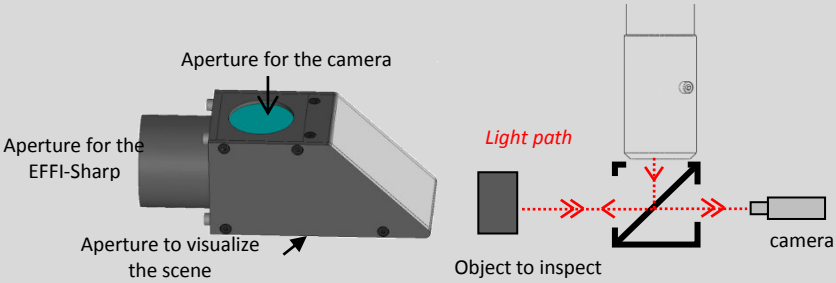
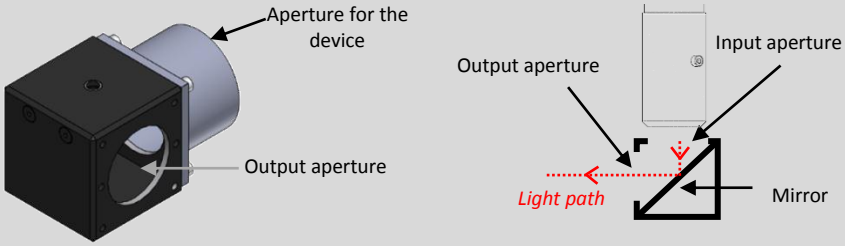
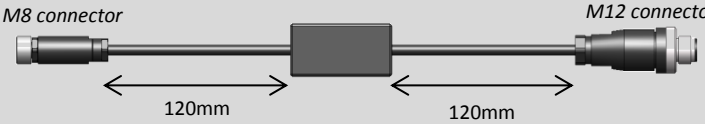
ACCESSORIES

	EFFILUX reference	Description
Mechanics	EFFM_1_0009	Fastener used to simplify the projector integration (orientation) *Delivered with 2 M4x12 screws*  
	EFFM_1_0001	Fastener used to simplify the projector integration *Delivered with 2 M4x20 and 1 M6x16 screws*  
Optics	EFFO-Polariser_0004	Polarizer integrated in the projector to polarize the output light
	EFFO_0007	Coaxial accessory without ghost effect 
	EFFO_0006	Provides a 90° angle between the light source and the illuminated area 
Electronics	EFFC-Cable_M12_0002 Binder: *79 3430 13 04*	M12 cable, 4 pins, 2000mm long
	EFFC-Cable_M12_0003 Binder: *79 3430 17 04*	M12 cable, 4 pins, 5000mm long
	EFFC-Cable_M12_0004 Binder: *79 3430 30 04*	M12 cable, 4 pins, 10000mm long
	EFFC-Cable_M12_0025 Phoenix : *1456938*	M12 cable, 4 pins, High-Flex, 1500mm long
	EFFC-Cable_M12_0026 Phoenix : *1456941*	M12 cable, 4 pins, High-Flex, 3000mm long
	EFFE-Comp_0006	 LED driver to use in the strobe configuration

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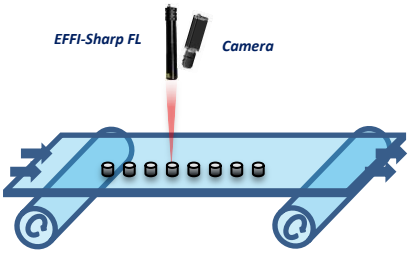
LED Pattern projector

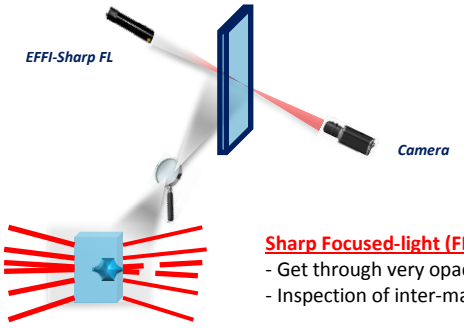
EFFI-Sharp FL

- **Intense** and **homogeneous** spot light
- **Standard** connections and fasteners
- **Flexible:**
  - Adjustable **working distance** [50mm,350mm]
  - Adjustable **illuminated area** [50mm², 2500m²]
  - Full range of colors: **from UV to IR, white**
  - Various **projected patterns**
- **Long lifetime** and few maintenance

APPLICATIONS:



Sharp Focused-light (FL):
- Very intense illumination for short working distance.
- Inspection of high speed objects, fluorescence



Sharp Focused-light (FL) through material:
- Get through very opaque material.
- Inspection of inter-material defects

OVERVIEW OF THE CHARACTERISTICS

Electronics	*Power supply*	24V DC or constant current
	Illumination mode	Continuous or strobe modes
	Connectors	M12 4 pins or M8 3 pins
	Power consumption	5W
Optics	*Wavelength*	Various wavelengths (from UV to IR, white)
	Projection system	Near Field, Middle Field, Far Field
	Projected pattern	Circular, square and custom patterns
Mechanics	*Maximum dimensions*	32mm x 220mm
	Focusing adjustment	A M3 screw on the objective
	Fastener	4 M4 holes on the side of the device
	Material	Device body : Aluminum alloy
Environment	*Working temperature*	0°C to 50°C
	IP code	IP54

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TECHNICAL CHARACTERISTICS

How to create the EFFI-Sharp?

EFFI-Sharp_FL_XX_XXX_X

Objective

Pattern shape

Wavelength (nm)

Near Field: ***NF*** for WD=[40;70]mm

Middle Field: ***MF*** for WD=[70;150]mm

Far Field: ***FF*** for WD=150;350]mm

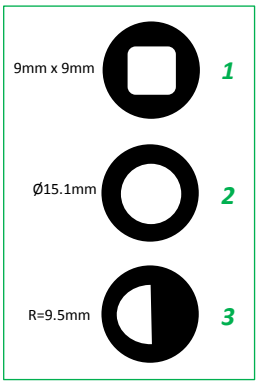
Available options:

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

Example: EFFI-Sharp_FL_NF_000_2_P_S

Available wavelengths:

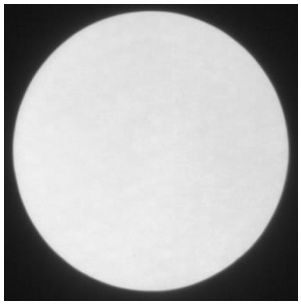
- White: ***000***
- Far UV: ***365***
- Near UV: ***405***
- Blue: ***465***
- Green: ***525***
- Red: ***625***
- Infrared: ***850***



Other wavelengths and patterns are available upon request

Optical characteristics

Uniformity of the pattern



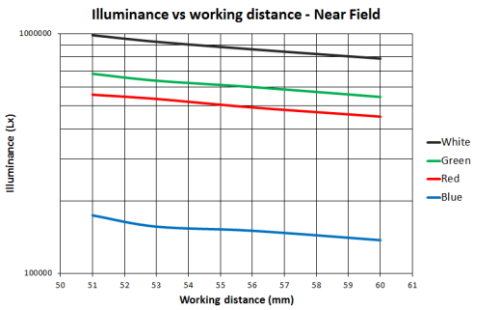
Horizontal profile

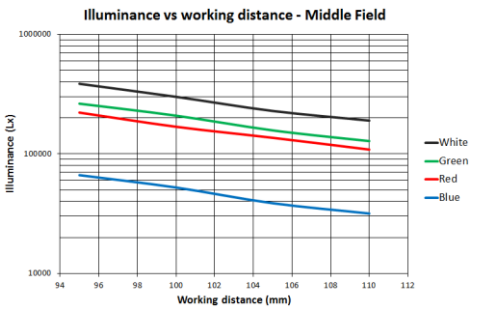
Vertical profile

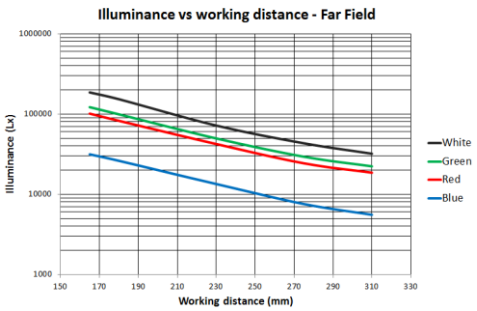
Uniformity larger than 80%

Pattern size and illuminance with the working distance

NB : Measurements achieved with a rounded pattern (Ø15mm)







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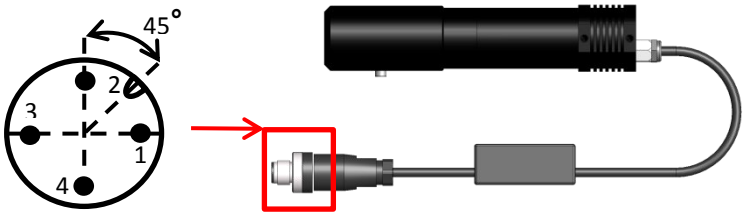
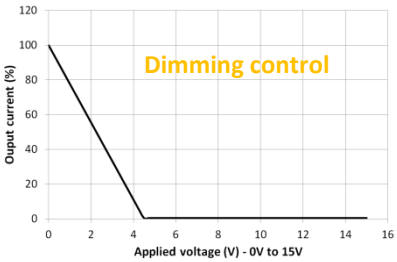
Electrical characteristics

Standard connection

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

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





Make sure that you never exceed the maximum voltage.

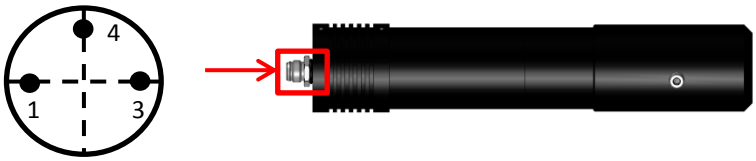
The device is supplied with a 24V (±5%) constant voltage source.

Connection with a current source

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

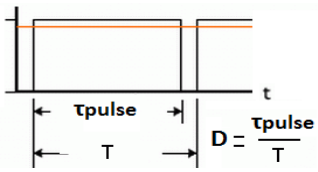
Be aware that the current source option cannot be used with the EFFI-Supply Wire but needs a specific M8 connector.

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



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

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



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

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

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

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

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

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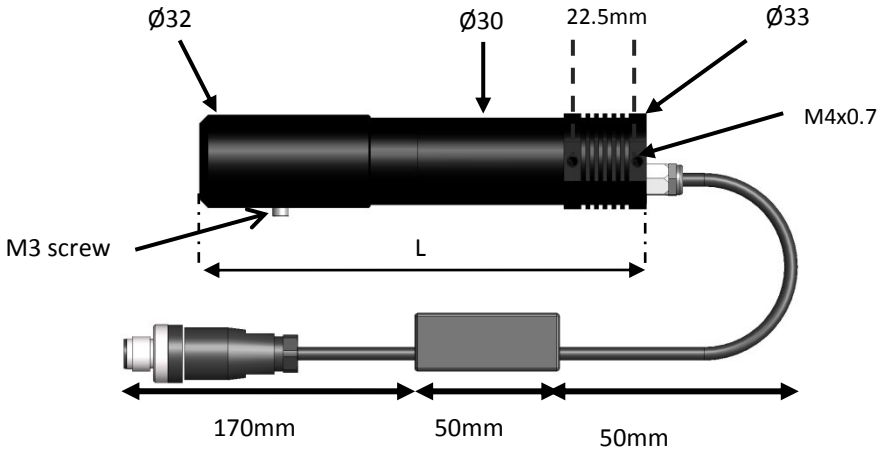
Mechanical considerations

Dimensions



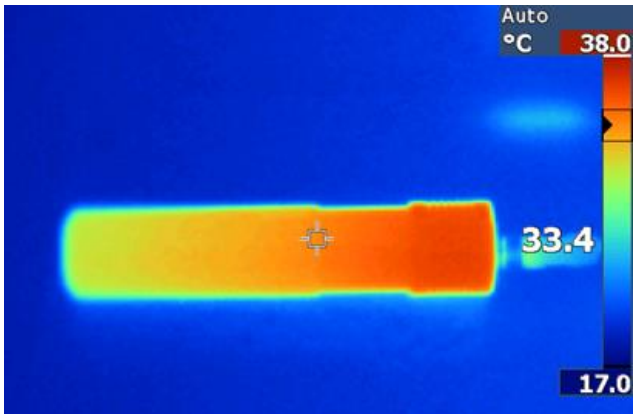
NB: Our accessories can be used to simply your set up.

	Near Field	***Middle Field***	***Far Field***
Min L	163mm	168 mm	185mm
Max L	173mm	173 mm	219mm

A sharp image is obtained by turning the device's ring in one or another direction until the image is in focus (first, loose carefully the M3 screw present on the objective tube).

Thermal considerations

Thanks to its design, the heat is efficiently dissipated from the LED.



ACCESSORIES

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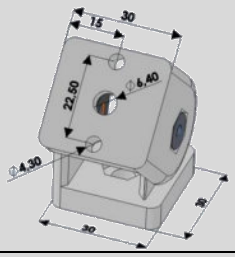
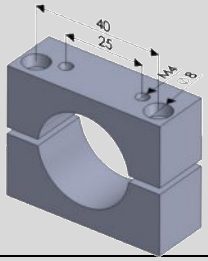
Mechanics	EFFM_1_0009	Fastener used to simplify the projector integration (orientation) *Delivered with 2 M4x12 screws*  
	EFFM_1_0001	Fastener used to simplify the projector integration *Delivered with 2 M4x20 screws*  
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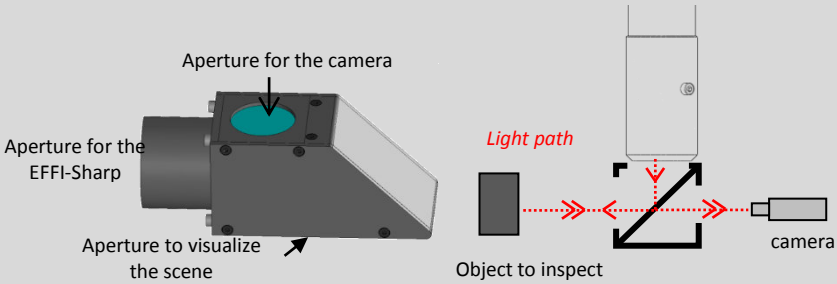
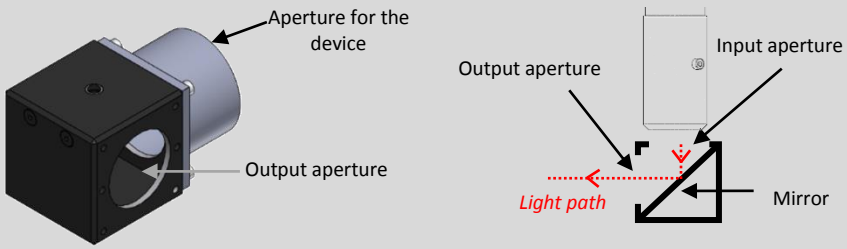
	EFFO_0007	Coaxial accessory without ghost effect 
	EFFO_0006	Provides a 90° angle between the light source and the illuminated area 
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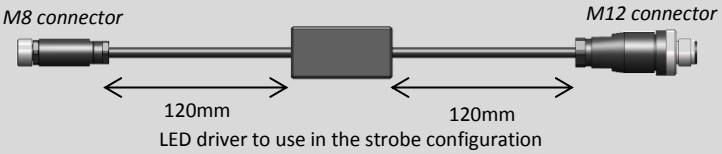
	EFFE-Comp_0006	 LED driver to use in the strobe configuration

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