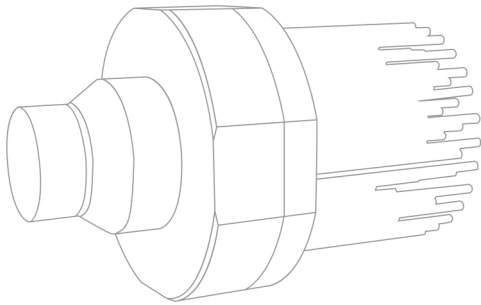


**3D PROJECTOR**

**ELL SERIES**



The ELL Series is a **structured light source**, which is ideal for 3D reconstruction applications or Stereo Vision applications.

This series offers great accuracy by using C-mount lens projection and offering three different masks: **Line**, **Grid**, or **Cloud of Dots**.

Since the ELL Series is a LED-based lighting solution, it is available in different colors and users do not need to worry about the speckle problems, eye safety and life time issues. This makes the ELL Series the ideal substitute for lasers.

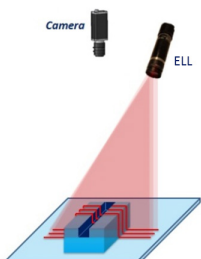
**MAIN FEATURES**

- Very intense and uniform illuminated area
- Long lifetime and few maintenance
- Compatible with most objectives (C-Mount)
- High depth of field for line version
- No speckle

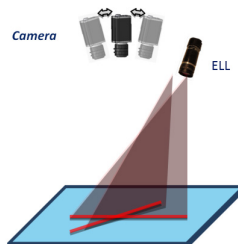


|                      | PV (passive cooling) version              | CP (compact) version                       |
|----------------------|---|--|
| Connector            | M12 - 5 contacts                          | M8 - 8 contacts                            |
| Power supply         | 24V DC                                    | Direct current (No driver = No protection) |
| Illumination mode    | Strobe or continuous mode                 | Strobe mode only                           |
| Available wavelength | White, Blue, Green, Red, IR               |  |
| Projected pattern    | Line, Cloud of dots or Grid               |  |
| Width x height       | 79.1mm x 150.6mm (without the objectives) | 42mm x 71mm (without the objectives)       |
| Fastener             | 8 x M5 holes on the sides of the device   | 8 x M5 holes on the sides of the device    |
| Material             | Device body: Aluminum alloy               |  |
| Working temperature  | 0° to 40° C                               | 0° to 40° C                                |
| IP code              | IP54                                      | IP54                                       |

**APPLICATIONS**



Stereovision and 3D profiling



Alignment applications

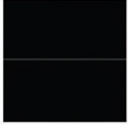
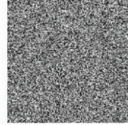
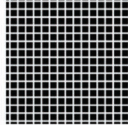


ELL (up) VS LASER (down):  
no speckle = more accurate

## OPTICAL CONSIDERATIONS

### Masks

The ELL is available with different type of masks.

| LINE (-LN)  | CLOUD OF DOTS (-CD)  | GRID (-GD)  |
|---|--|---|
| 1 line: 10µm<br>line length : 13mm<br> | Cloud of dots density 50%<br>Surface 12.8x9.6 mm <sup>2</sup><br> | Grid 40x40 lines 50µm<br>Surface 10x10 mm <sup>2</sup><br> |

### Pattern dimension

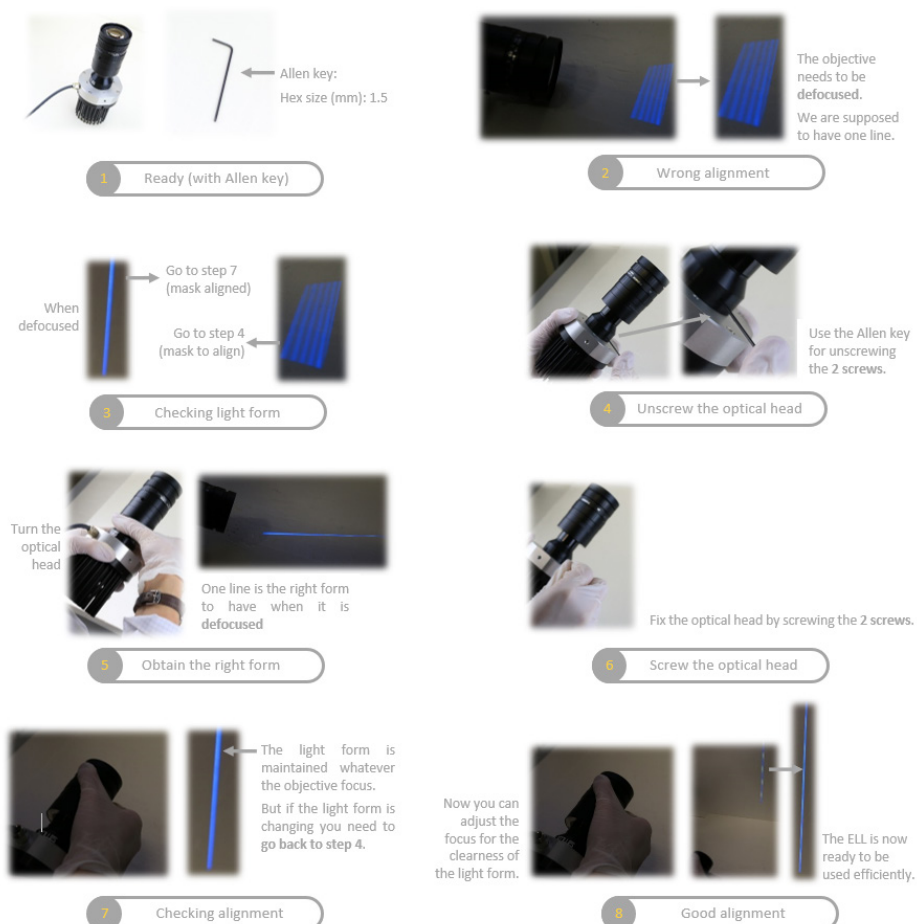
Depending on the working distance (WD) and the C-mount objective selected, different pattern sizes are obtained:

| Objective   | Line width<br>Mask dimensions : 13mm x 10µm (-LN) |            |            |             |
|-------------|---|------------|------------|-------------|
|             | WD = 30 cm  | WD = 50 cm | WD = 80 cm | WD = 100 cm |
| f = 12.5 mm | 0.25 mm   | 0.40 mm    | 0.64 mm    | 0.80 mm     |
| f = 16 mm   | 0.20 mm   | 0.32 mm    | 0.48 mm    | 0.60 mm     |
| f = 35 mm   | 0.08 mm   | 0.14 mm    | 0.23 mm    | 0.28 mm     |
| f = 50 mm   | 0.06 mm   | 0.10 mm    | 0.16 mm    | 0.20 mm     |
| f = 75 mm   | n.a.  | n.a.       | 0.10 mm    | 0.13 mm     |

| Objective   | Pattern dimensions HxW<br>Mask dimensions : 12.8mm x 9.6mm (-CD) |             |             |              |
|-------------|--|-------------|-------------|--------------|
|             | WD = 30 cm   | WD = 50 cm  | WD = 80 cm  | WD = 100 cm  |
| f = 12.5 mm | 32cm x 23cm  | 51cm x 37cm | 82cm x 59cm | 102cm x 73cm |
| f = 16 mm   | 25cm x 19cm  | 41cm x 31cm | 66cm x 49cm | 82cm x 61cm  |
| f = 35 mm   | 11cm x 8cm   | 18cm x 14cm | 29cm x 22cm | 36cm x 27cm  |
| f = 50 mm   | n.a.   | 12cm x 9cm  | 20cm x 15cm | 25cm x 19cm  |
| f = 75 mm   | n.a.   | n.a.        | 13cm x 10cm | 16cm x 12cm  |

### Alignment for line version

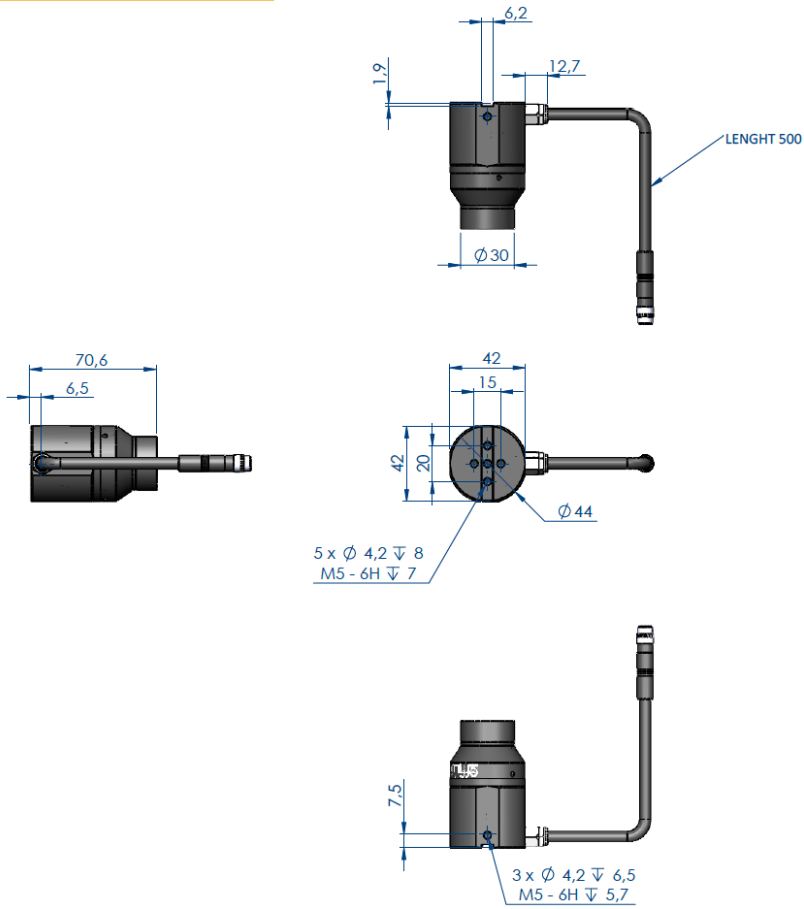
When using the line mask with the ELL Series, please make align the mask with the LED to optimize the depth of field.



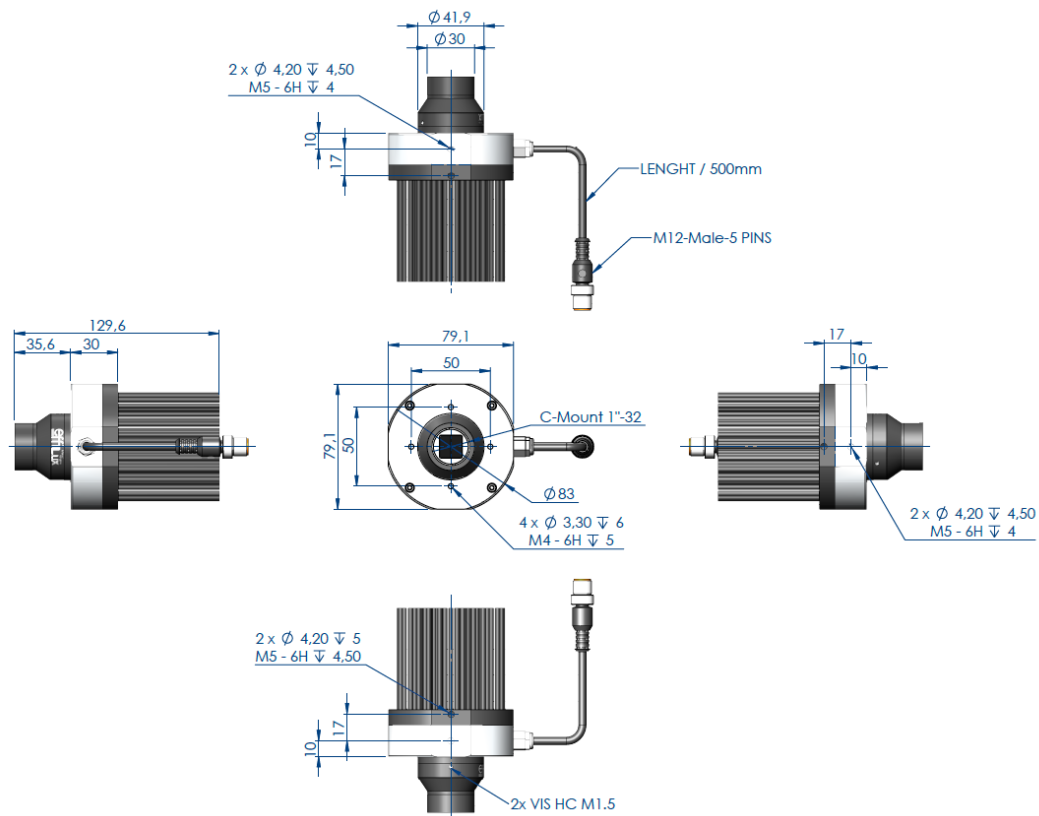
- Ready (with Allen key)**  
An Allen key with a hex size of 1.5 mm is used to adjust the mask.
- Wrong alignment**  
The objective needs to be defocused. We are supposed to have one line.
- Checking light form**  
When defocused, the light form is blurry. Go to step 7 (mask aligned) or step 4 (mask to align).
- Unscrew the optical head**  
Use the Allen key for unscrewing the 2 screws.
- Obtain the right form**  
Turn the optical head. One line is the right form to have when it is defocused.
- Screw the optical head**  
Fix the optical head by screwing the 2 screws.
- Checking alignment**  
The light form is maintained whatever the objective focus. But if the light form is changing you need to go back to step 4.
- Good alignment**  
Now you can adjust the focus for the clearness of the light form. The ELL is now ready to be used efficiently.

**DIMENSIONS (MM)**

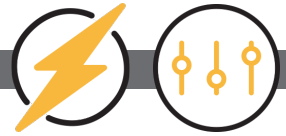
**ELL-CP : Compact version**



**ELL-PV : Passive cooling version**




## ELECTRONICAL CONSIDERATIONS - PV AND FN VERSIONS



### Contact arrangement

When using the ELL Series, please use a 24VDC.

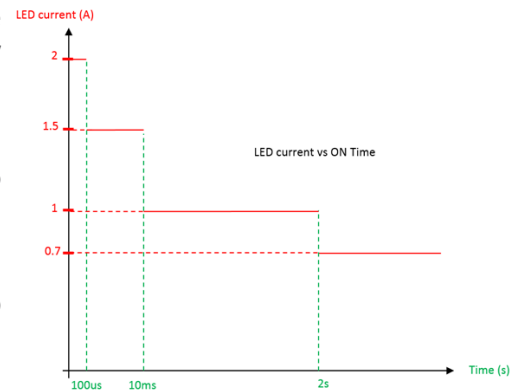
| Contact arrangement   | Number | Color Contact | Designation   |
|---|--------|---------------|---|
|  <p>MALE</p> <p>M12 male connector</p> | 1      | Brown         | +24V  |
|   | 2      | White         | <b>NPN TRIGGER (trigger on falling edge) for Auto-strobe</b><br>Light ON if $V_{NPN} < 1.5V$ DC<br>max 24V - Analog Voltage   |
|   | 3      | Blue          | GND   |
|   | 4      | Black         | <b>PNP TRIGGER [trigger for rising edge] for Auto-strobe</b><br>Light ON if $V_{PNP} > 3V$ DC<br>max 24V - Analog Voltage   |
|   | 5      | Grey          | <b>AIC: Analog Intensity Control for Dimming Control</b><br>(If AIC is not connected, the light will light on at 100% as if VAIC = 24V. If you do not need to adjust light level, do not connect/use this PIN) - max 24V - Analog Voltage |

### Autostrobe feature and continuous mode

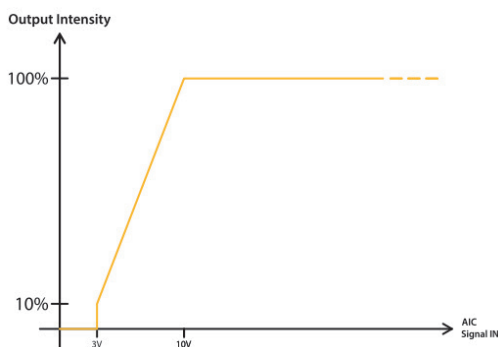
The autostrobe integrated controller in the ELL Series is set to automatically strobe the LED. When the ELL Series is trigger shorter than  $100\mu s$ , the LED is automatically overdriven at 2A. When the trigger is longer than  $100\mu s$ , the ELL Series will automatically decrease the current to protect the LED.

If a duty cycle is larger than 0.3, the ELL Series will enter a protection mode to protect the LED and will stay off for 2 seconds. The ELL Series will check every 2 seconds if this duty cycle is maintained.

When using the ELL Series in continuous mode (set trigger continuously), the LED will be driven at 700mA.



### Dimming control

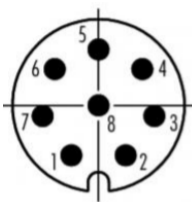


By adjusting the analog tension, light intensity can be controlled from 10% to 100%.  
If the Input AIC is not connected, the EFFI-LASE will act as if AIC was set at 24V.

## ELECTRONICAL CONSIDERATIONS - CP VERSION

### Contact arrangement

The ELSB-CP is supplied with a direct current through the M8-8 contacts (male).

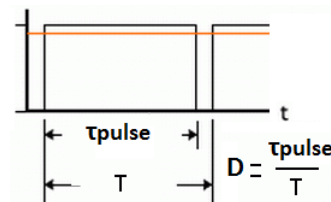
| Contact arrangement   | Number | Color Contact | Designation       |
|---|--------|---------------|-------------------|
|  <p>M8 8 contacts male connector</p> | 1      | White         | -V <sub>LED</sub> |
|   | 2      | Brown         | +V <sub>LED</sub> |
|   | 3      | Green         | n.a.              |
|   | 4      | Yellow        | n.a.              |
|   | 5      | Grey          | n.a.              |
|   | 6      | Pink          | n.a.              |
|   | 7      | Blue          | -TH (Thermistor)  |
|   | 8      | Red           | +TH (Thermistor)  |

### Direct current mode

You can see below 5 possible configurations depending on the current that you provide to the ELL-CP.

Contact EFFILUX for more information.

| Configuration | Current | Max pulse duration (μs) / τ <sub>pulse</sub> | D      |
|---------------|---------|--|--------|
| 1             | 1.2A    | 50 000                                       | 0.5    |
| 2             | 1.5A    | 10 000                                       | 0.1    |
| 3             | 2A      | 1 000  | 0.01   |
| 4             | 2.5A    | 100  | 0.001  |
| 5             | 3.5A    | 40   | 0.0004 |



## PRODUCT LINE UP

Power consumption is given for white products.

### ELL-CP : Compact version

| Series | Part Number    | Color    | Wavelength / Color temperature | Connector | Weight | Pattern       |
|--------|----------------|----------|--------------------------------|-----------|--------|---------------|
| ELL    | ELL-CP-30SW-LN | White    | 5500 K ± 500 K                 | M8        | 200g   | Line          |
| ELL    | ELL-CP-30BL-LN | Blue     | 465nm                          |           |        |               |
| ELL    | ELL-CP-30GR-LN | Green    | 525nm                          |           |        |               |
| ELL    | ELL-CP-30RD-LN | Red      | 625nm                          |           |        |               |
| ELL    | ELL-CP-30IR-LN | Infrared | 850nm                          |           |        |               |
| ELL    | ELL-CP-30SW-CD | White    | 5500 K ± 500 K                 | M8        | 200g   | Cloud of dots |
| ELL    | ELL-CP-30BL-CD | Blue     | 465nm                          |           |        |               |
| ELL    | ELL-CP-30GR-CD | Green    | 525nm                          |           |        |               |
| ELL    | ELL-CP-30RD-CD | Red      | 625nm                          |           |        |               |
| ELL    | ELL-CP-30IR-CD | Infrared | 850nm                          |           |        |               |
| ELL    | ELL-CP-30SW-GD | White    | 5500 K ± 500 K                 | M8        | 200g   | Grid          |
| ELL    | ELL-CP-30BL-GD | Blue     | 465nm                          |           |        |               |
| ELL    | ELL-CP-30GR-GD | Green    | 525nm                          |           |        |               |
| ELL    | ELL-CP-30RD-GD | Red      | 625nm                          |           |        |               |
| ELL    | ELL-CP-30IR-GD | Infrared | 850nm                          |           |        |               |

## ELL-PV : Passive cooling version

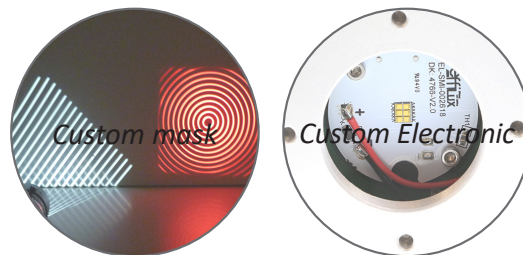
| Series | Part Number    | Color    | Wavelength / Color temperature | Power Consumption |            | Connector | Weight | Pattern       |
|--------|----------------|----------|--------------------------------|-------------------|------------|-----------|--------|---------------|
|        |                |          |                                | Strobe            | Continuous |           |        |               |
| ELL    | ELL-PV-30SW-LN | White    | 5500 K ± 500 K                 | 45W               | 15W        | M12       | 400g   | Line          |
| ELL    | ELL-PV-30BL-LN | Blue     | 465nm                          |                   |            |           |        |               |
| ELL    | ELL-PV-30GR-LN | Green    | 525nm                          |                   |            |           |        |               |
| ELL    | ELL-PV-30RD-LN | Red      | 625nm                          |                   |            |           |        |               |
| ELL    | ELL-PV-30IR-LN | Infrared | 850nm                          |                   |            |           |        |               |
| ELL    | ELL-PV-30SW-CD | White    | 5500 K ± 500 K                 | 45W               | 15W        | M12       | 400g   | Cloud of dots |
| ELL    | ELL-PV-30BL-CD | Blue     | 465nm                          |                   |            |           |        |               |
| ELL    | ELL-PV-30GR-CD | Green    | 525nm                          |                   |            |           |        |               |
| ELL    | ELL-PV-30RD-CD | Red      | 625nm                          |                   |            |           |        |               |
| ELL    | ELL-PV-30IR-CD | Infrared | 850nm                          |                   |            |           |        |               |
| ELL    | ELL-PV-30SW-GD | White    | 5500 K ± 500 K                 | 45W               | 15W        | M12       | 400g   | Grid          |
| ELL    | ELL-PV-30BL-GD | Blue     | 465nm                          |                   |            |           |        |               |
| ELL    | ELL-PV-30GR-GD | Green    | 525nm                          |                   |            |           |        |               |
| ELL    | ELL-PV-30RD-GD | Red      | 625nm                          |                   |            |           |        |               |
| ELL    | ELL-PV-30IR-GD | Infrared | 850nm                          |                   |            |           |        |               |

For cables cf. the datasheet of the ECB cables series.

For fasteners cf. the datasheet of the BK fasteners series.

## CUSTOM - ON REQUEST

### EXAMPLE OF CUSTOM



## EU DIRECTIVE



In accordance with EU machinery directive, EMC directive, and low voltage directive, machines and electronic devices not marked with the CE logo are subject to distribution restrictions within the EU. All EL Series products. These products will maintain the EU mandate compatibility of our customers' machinery and electronic devices.

## RoHS DIRECTIVE

All products from the EL Series comply with the RoHS Directive.

## MICRO WEBSITE

[www.el-series.com](http://www.el-series.com)