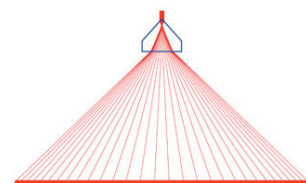
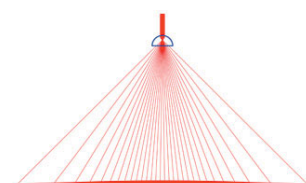
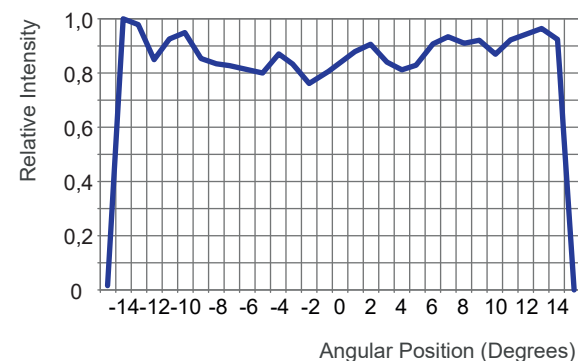


### Relative intensity vs. angular position along line length

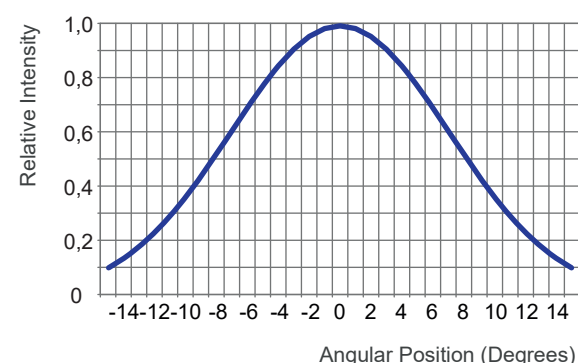
Comparison of intensity distribution over the line length of uniform line generated by our line laser modules and Gaussian line formed by cylindrical lens.



Uniform line

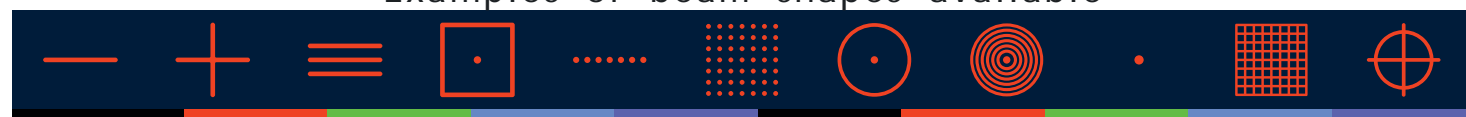


Gaussian line



Frankfurt Laser Company offers wide variety of beam-shaping optic for different applications. We are able to deliver custom-made diffractive optic that provides beam patterns required by the application. A customer is welcome to choose different focusing and depth of field parameters to meet most demanding requirements.

### Examples of beam shapes available



For detailed datasheets  
and application notes  
please visit our home-page  
[WWW.FRLASERCO.COM](http://WWW.FRLASERCO.COM)

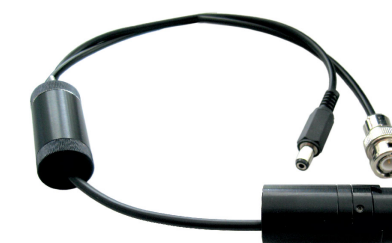
## Frankfurt Laser Company

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# FRANKFURT LASER COMPANY

## LASER DIODE MODULES



### Machine Vision and Alignment Lasers

Machine vision and alignment lasers are easy to use plug-and-play devices suitable for wide range of applications including machine vision and robotics, alignment and positioning of materials (garments, textile, paper, timber, glass, stone, concrete and metal).

Laser modules offer wide range of projections including adjustable line, uniform or Gaussian, multiple lines, single dot and crosshair. Laser modules are supplied with red, green, blue and IR emission and different intensities in order to maximize projection visibility on surfaces with variable light reflection.

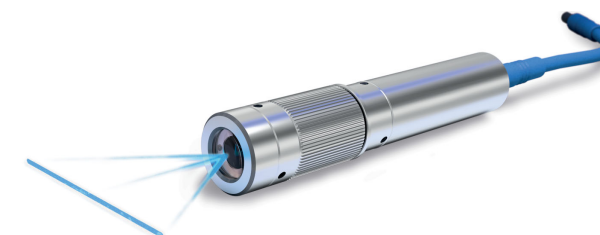


#### Applications:

Machine vision  
Metrology  
Saw cutting  
Automotive  
Fabric cutting  
Laser triangulation  
Patient positioning  
Tyre manufacturing  
Graphics alignment  
Rotary press positioning  
Garment manufacturing  
Quality control  
and packaging  
Glass cutting and drill  
positioning

#### General Features:

Plug & play system  
ESD Protection  
Rugged design  
TTL/analog modulation  
Uniform or Gaussian line  
Reverse polarity protection  
Electrically isolated housing  
Excellent focus & line quality  
User adjustable focus control  
110/240 VAC & 5/24VDC powered  
No technical laser experience  
required  
Available with red, green, blue  
and IR output



[www.frlaserco.com](http://www.frlaserco.com)

## HMML Series

The HMML Series provides the **unique feature:**  
**The line stays in place while adjusting the focus. There is no need to readjust the line position.**

It is made for applications with varying working distances and fixed position of the line, e.g. tyre manufacturing. The HMML series line laser module provides crisp, uniform line with sharp ends.

Gaussian line is available on request. TTL modulation up to 1 MHz (532nm up to 10kHz) is an option.

Wavelength @ 25°C	405nm – 1060nm
Power output @ 25°C	450nm : 5mW, 10mW, 20mW, 30mW, 40mW, 50mW 532nm : 1mW, 5mW, 10mW, 20mW 635nm : 5mW, 10mW, 20mW, 30mW 660nm : 5mW, 10mW, 20mW, 30mW, 50mW, 100mW, 150mW 785nm : 5mW, 10mW, 20mW, 30mW, 50mW, 100mW, 150mW 830nm : 5mW, 10mW, 20mW, 30mW, 50mW, 100mW, 150mW
Power stability	±5 % / 2 h
Beam shape	line, width >50µm adjustable
Fan angle	10°/15°/20°/30°/45°/60°/75°/90° and custom
Focus	adjustable, without line rotation
Operating temperature band	-10°C to 50°C
Dimensions	Ø 30mm x 130mm



## ML2040 Series

The ML2040 laser module provides high output power for machine vision applications in harsh environments. The housing has the small footprint the size of 2 matchboxes – the smallest of its class on the market - is electrically isolated and satisfies the industry protection class IP65 (IP67 optional) conditions. It can be equipped with various optics including uniform or Gaussian line, parallel lines, single dot, crosshair, single circle and others. The module is also available with a fiber output and various industry standard fiber connectors.

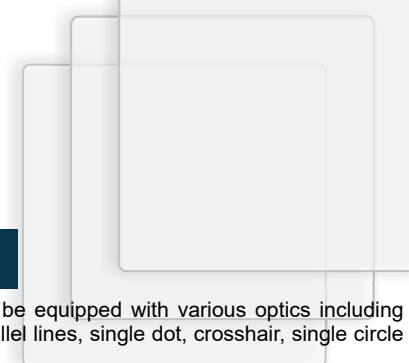
TTL modulation up to 1MHz and analog power adjustment input with modulation up to 100kHz are available. Power stability is <±0.5% over 24 hours, <±3% over the lifetime.



## HSML-mini

The HSML-mini series is our smallest laser module. It is made to be used in portable devices or in products where small size is important.

Wavelength @ 25°C	405 nm – 1060 nm
Power output @ 25°C	0.2 mW - 5 mW
Beam shape	elliptic (aspect ratio 1:3), round (aspect ratio 1:1.2)
Beam divergence	<1 mrad
Focus	fixed
Operating temperature	-10°C to 50°C
Dimensions	Ø 12 mm x 22 mm



## HSML Series

The HSML laser module can be equipped with various optics including uniform or Gaussian line, parallel lines, single dot, crosshair, single circle and other.

It is the smallest size line module on the market delivered with even line beam shape. The focus is user adjustable. TTL modulation up to 1MHz and analogue – up to 100kHz are an option.

Wavelength @ 25°C	405nm – 1060nm
Power output @ 25°C	635nm : 5mW, 10mW, 20mW, 30mW, 50mW, 100mW 660nm : 5mW, 10mW, 20mW, 30mW, 50mW, 100mW 785nm : 5mW, 10mW, 20mW, 30mW, 50mW, 100mW 830nm : 5mW, 10mW, 20mW, 30mW, 50mW, 100mW
Beam divergence	0.5mrad to 1mrad
Beam shaping optic (optional)	line, width >50µm fan angle 10°/30°/45°/60°/75°/90° and custom parallel lines, crosshair, single dot, single circle and other
Focus	adjustable
Dimensions	Ø 12.6mm x 55mm

## HAML Series

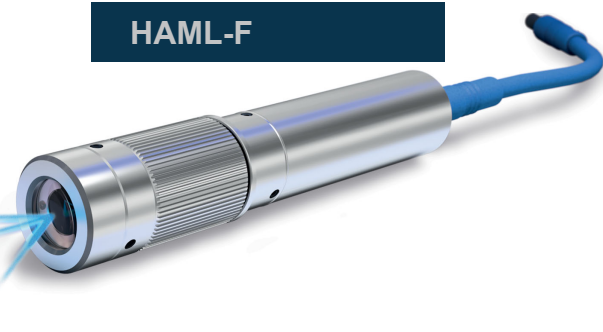
The HAML series line laser module provides crisp, uniform line with sharp ends also when mounted off-axis to projection plane. They are optimized for line uniformity (up to +/-10%) and long depth-of-field or thin line. Focus can be adjusted easily by rotating the upper part by hand. It fulfills the IP67 requirements which make it usable in harsh environmental conditions i.e. production facilities.

The HAML-E version has separated unit for drive electronics that has the advantage of reducing the size of the optical head. The module can be used where space is limited.

TTL modulation up to 1MHz (532nm up to 10kHz) or analog modulation up to 100kHz is an option.

Wavelength @ 25°C	405nm – 1060nm
Power output @ 25°C	450nm : 5mW, 10mW, 20mW, 30mW, 40mW, 50mW 532nm : 5mW, 10mW, 20mW, 30mW, 50mW 635nm : 5mW, 10mW, 20mW, 30mW, 50mW, 100mW 660nm : 5mW, 10mW, 20mW, 30mW, 50mW, 100mW 785nm : 5mW, 10mW, 20mW, 30mW, 50mW, 100mW 830nm : 5mW, 10mW, 20mW, 30mW, 50mW, 100mW
Power stability	<5 % over 2 h
Beam shape	line, width >50µm adjustable
Fan angle	10°/15°/20°/30°/45°/60°/75°/90° and custom
Focus	adjustable
Operating temperature	-10°C to 50°C
Dimensions (HAML)	Ø 18mm x 88mm
Dimensions (HAML-E)	Ø 20mm x 45mm (optical head & driver)

### HAML-F



### HAML-E



## HNML Series

The HNML series line laser modules provides crisp, uniform line with sharp ends. Gaussian line is available on request.

TTL modulation up to 1MHz and analogue – up to 50kHz (532nm – TTL 10kHz) are an option.

Wavelength @ 25°C	405nm – 1060nm
Power output @ 25°C	450nm : 5mW, 10mW, 20mW, 30mW, 40mW, 50mW 532nm : 1mW, 5mW, 10mW, 15mW 635nm : 5mW, 10mW, 20mW, 30mW 660nm : 5mW, 10mW, 20mW, 30mW, 50mW, 100mW 785nm : 5mW, 10mW, 20mW, 30mW, 50mW, 100mW 830nm : 5mW, 10mW, 20mW, 30mW, 50mW, 100mW
Power stability	±5% / 2 h
Beam shape	line, width >50µm adjustable
Fan angle	10°/15°/20°/30°/45°/60°/75°/90° and custom
Optional beam shaping optic	parallel lines, crosshair, single dot, single circle and other
Focus	adjustable
Operating temperature band	-10°C to 45°C
Dimensions	Ø 15mm x 70mm

The HNML series line laser module can additionally be provided with various optics including parallel lines, single dot, crosshair, single circle and other. The focus is user adjustable.

