# HAML Line Laser Module

## Applications

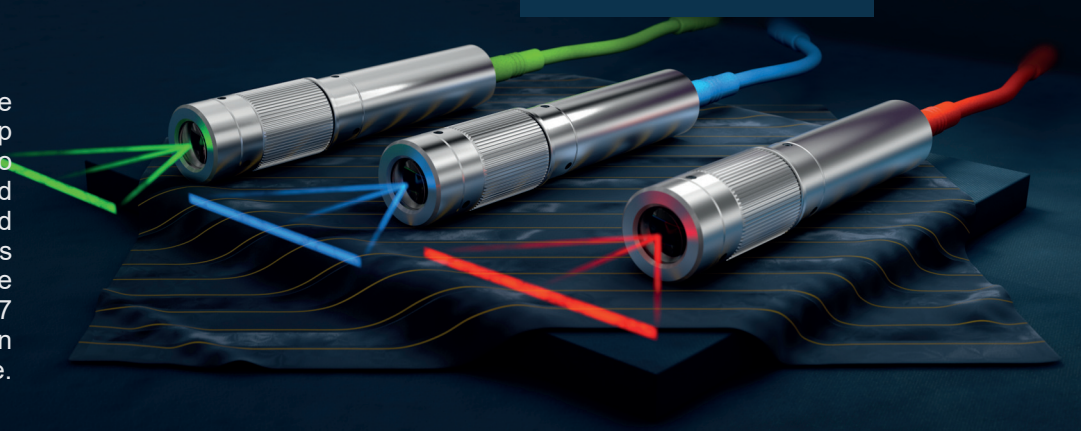
- Machine vision
- Industrial inspection
- 3D contour mapping
- Positioning & visualization
- Biomedical (e.g. flow cytometry)
- High-end alignment

## General Features

- Plug and play system
- Available with green, red and infrared output
- Uniform line
- User adjustable focus control
- Excellent focus & line quality
- Rugged design
- ESD Protection
- Reverse polarity protection
- Electrically isolated housing
- Optional 12/24VDC and 110/240 power supply
- No technical laser experience required

# HAML Series Line Laser Diode Module

HAML-F



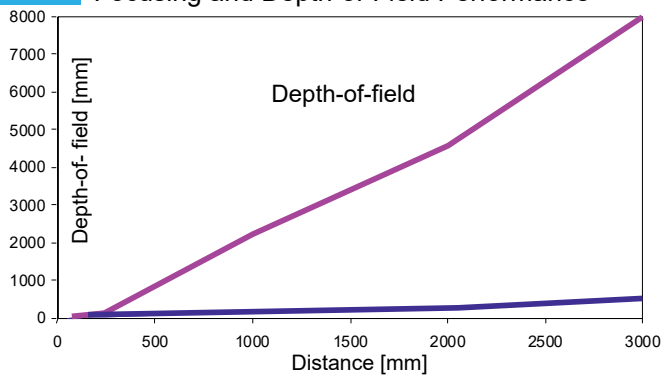
The HAML series line laser module provides crisp, uniform line with sharp ends also when mounted off-axis to projection plane. They are optimized for line uniformity (up to +/-10%) and long depth-of-field or thin line. Focus can be adjusted easily by rotating the upper part by hand. It fulfills the IP67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


## Specifications

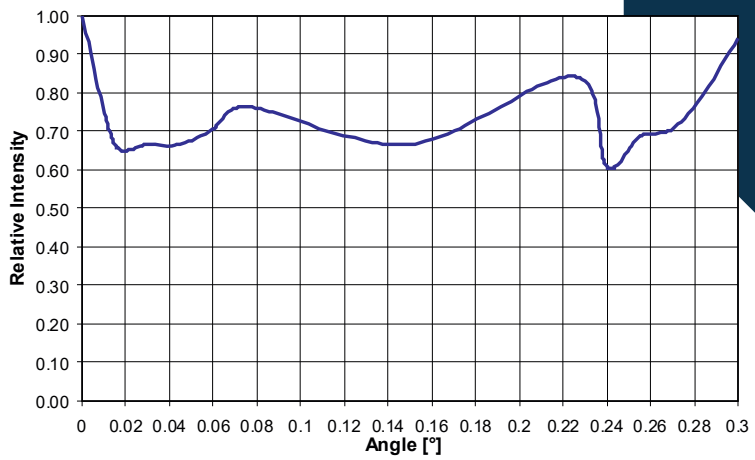
| | |
|---|---|
| Wavelength @ 25°C | 405nm – 1060nm |
| Power output @ 25°C | 450nm : 5mW, 10mW, 20mW, 30mW, 40mW, 50mW<br>532nm : 5mW, 10mW, 20mW, 30mW, 50mW<br>635nm : 5mW, 10mW, 20mW, 30mW, 50mW, 100mW<br>660nm : 5mW, 10mW, 20mW, 30mW, 50mW, 100mW<br>785nm : 5mW, 10mW, 20mW, 30mW, 50mW, 100mW<br>830nm : 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) |

## Focusing and Depth-of-Field Performance

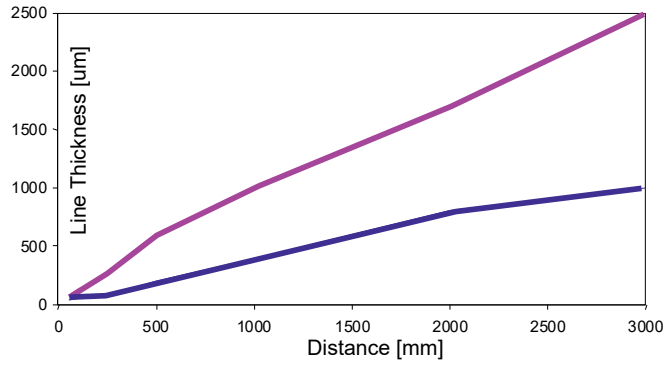



## Power Distribution non-Gaussian Line

(Typical Profile)

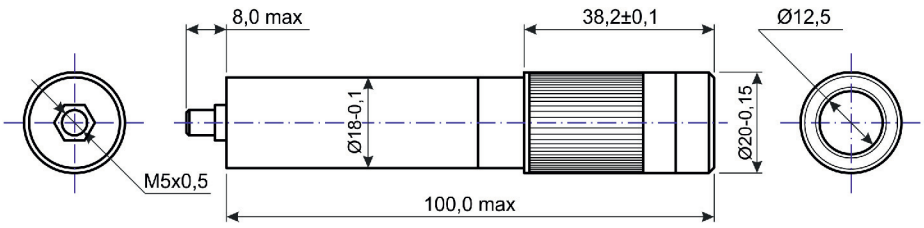


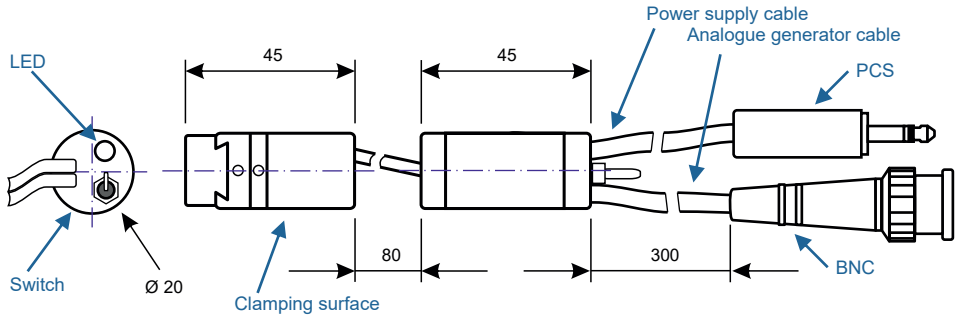

## Line Thickness




Small Focus
Long Depth-of-field

## HAML Housing Drawing




## HAML-E Housing Drawing

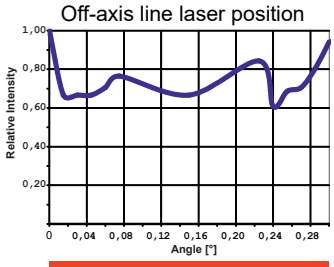
Dimensions in mm
Tolerances ± 0.2mm

## Off-Axis Advantage

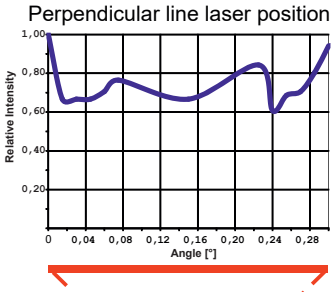
Conventional line lasers have to be used perpendicular to a surface the line has to be projected on. An off-axis position – position at the angle to illuminated surface – leads to inhomogeneous light distribution along the line.

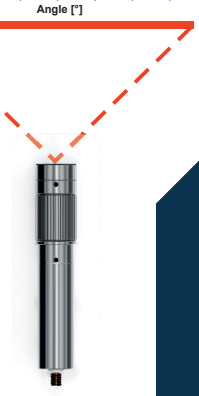
The HAML series laser diode modules can be easily adapted to an off-axis angle while maintaining uniform line intensity.

Off-axis line laser position




Perpendicular line laser position



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