Lasiris™ SNF Laser

FEATURES

- 635 to 1550 nm
- Power up to 200 mW
- Uniformity down to ±15% for laser line generators
- Wide range of patterns and fan angles
- Focusable
- ESD, over-temperature, over-voltage, and reverse-polarity protection
- Rugged, shock and vibration resistant design
- Two year warranty

LASER LINE GENERATOR AND OTHER STRUCTURED LIGHT PATTERNS

StockerYale's world-renowned Lasiris™ SNF laser transforms the familiar laser dot into a wide range of structured light patterns including single and multiple laser lines with uniformity down to ±15%. Straight laser lines are projected by allowing one dimension of light to fan out while maintaining tight control over the other, resulting in a uniform sheet-of-light.

What distinguishes the SNF laser from conventional lasers (with cylindrical optics) is the evenness of the illumination pattern. Lasiris™ lasers incorporate a patented optical laser line generator that eliminates Gaussian distribution of the light, resulting in the most uniform laser lines on the market. The design provides superior quality light patterns while avoiding the intricacies of installation alignment and detector calibration.

For applications requiring uniform flat-top illumination, the SNF laser can be easily integrated with the **Flat-Top^2 Generator**, StockerYale's refractive beam shaper that converts a Gaussian beam into a diverging, focused, or collimated flat-top profile.

Please visit our website for a list of accessories and options for the SNF laser.

StockerYale

Applications

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

Options and custom units

The laser is available with options allowing you to strobe or control its output electronically and with a wide selection of accessories. Visit us online or contact our application engineers for further details concerning specific requests, since custom units can be built for specialized applications.

Some available patterns

Single Line

Crosshair*

Parallel Lines

4 x 4 Grid

Dot Line

7x7 Dot Matrix

Single Circle

7 Concentric Circles

Single Dot

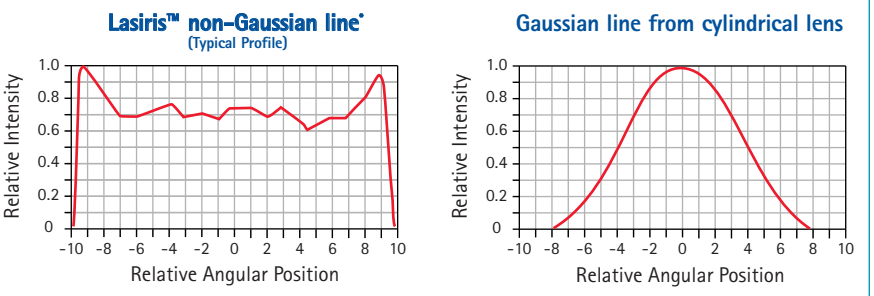
See ordering information section for more patterns or call us.

* Lasiris™ crosshair projectors have a single optical component, unlike conventional crosshairs that are formed either by using two lasers or by splitting and recombining one beam to form a cross.

Uniform intensity laser lines

Conventional laser line patterns are often generated by cylindrical optics that produce a Gaussian line profile with a bright center and fading ends. Lasiris™ patented beam shaping optics spread the light into an evenly illuminated line, resulting in a crisp, uniform line with sharp ends.

Line intensity profile along line length



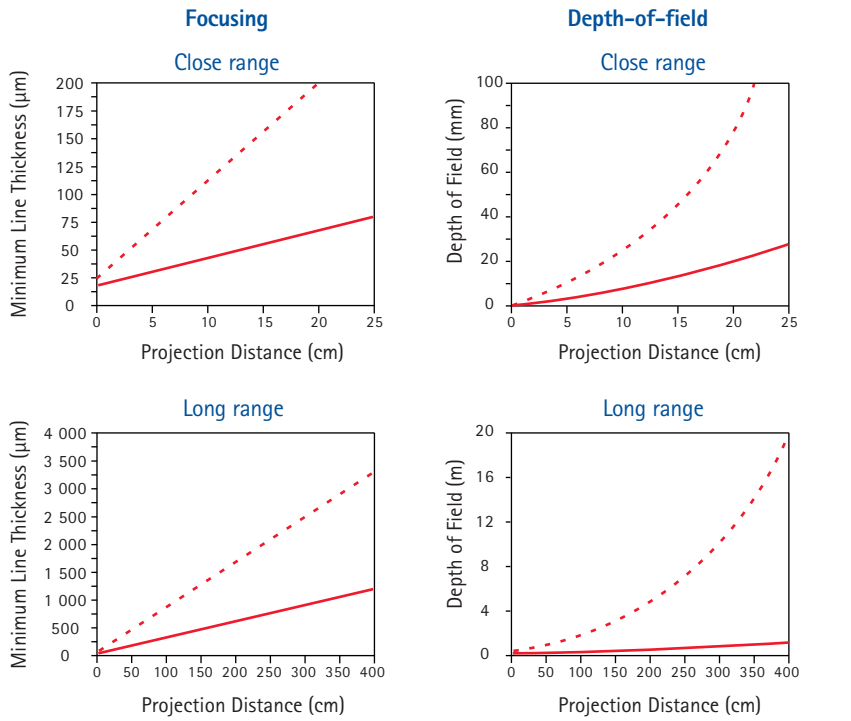
Relative intensity vs. angular position along line length

*Improve line uniformity to ± 25, 20, or 15%. Request this option at the time of order.

Focusing performance

The following figures show the typical focusing and depth-of-field performance of the SNF laser line generator. The focus charts indicate the minimum line thickness (at $1/e^2$) achievable for a specific projection distance. The depth-of-field is defined as twice the distance over which the thickness of the line has increased by a factor of $\sqrt{2}$.

Focusing and depth-of-field performance



Other lenses are available with different focusing performance curves. Call for details.

These focus charts are useful for establishing the smallest achievable line thickness for your application. The **501L** will produce the smallest line thickness. The **701L** produces a thicker line but maintains the line thickness over a longer distance.

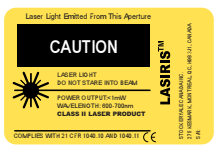
The laser can be **collimated** for minimum divergence. Also, by specifying a desired line thickness and working distance, the laser can be preset to your precise requirements.

Lasers and eye safety

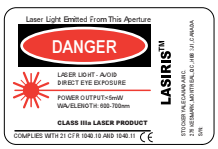
Our lasers can comply with CDRH and IEC classification. Lasers fall in different safety classes depending on output power, wavelength and fan angle.

According to CDRH 21CFR1040.10 regulations, they can be classified Class II, IIIa, or IIIb.

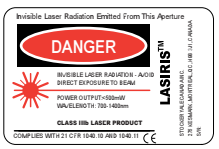
Class II

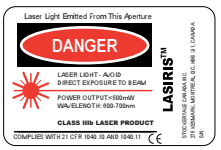


Class IIIa



Class IIIb





According to IEC 60825-1 regulations, they can be classified Class 1, 1M, 2, 2M, 3R, or 3B. For Class 1M and 2M lasers, viewing the laser output with certain optical instruments (magnifiers, binoculars, etc.) may pose an eye hazard.

Call us, or visit our website for further details.

CAUTION: It is important to follow laser safety rules and wear appropriate protective eyewear when working around lasers. Use of controls, adjustments or performance of procedures other than those specified in the instruction manual may result in hazardous radiation exposure.

Specifications

Mechanical specifications

Weight	65 g (with separate electronics: 70 g)
Dimensions	See dimensional diagrams on page 4
Housing material	Black anodized aluminum

Optical specifications

Diode power	1 to 200 mW
Wavelength	635 to 1550 nm
Intensity distribution[1]	Uniform (non-Gaussian) lengthwise, Gaussian widthwise
Fan angles[1]	1 to 120° and custom
Line uniformity[1]	Improve line uniformity to ± 25, 20 or 15%, depending on model
Bore sighting	< 3 mrad

[1] For line generators.

Environmental specifications

Operating temperature	-10°C to +48°C with bracket
Wavelength drift	0.25 nm/°C typical
Over-temperature protection, ESD protection	

Electrical specifications: Power supply

Input voltage	4.8 - 6.5 VDC (6 VDC optimal) Optional 9,12,24 VDC, 115/220 VAC
Connector type or custom	Male phono-jack 3.5 mm ø,
Slow start time delay	< 250 msec for most models
Reverse-polarity protection, Over-voltage protection	

Standard Options

Power options

Power Adjustment Potentiometer

The laser power can be easily changed by adjusting an optional built-in potentiometer with a small screwdriver.
Code "P".

Power Adjustment by External Signal

Coding (see options on figure below):

- Standard modulation

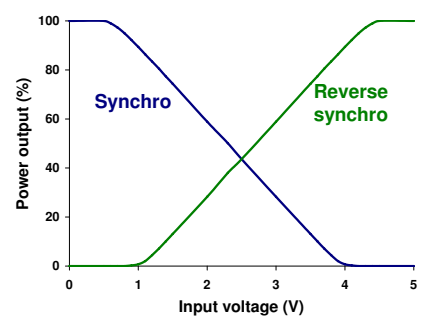
S (synchro): 10KHz FS* (fast synchro): 300KHz
Input voltage = 0V : laser "ON" Input voltage = 5V : laser "OFF"

- Reverse modulation: add R*

RS (reverse synchro): 10KHz RFS* (reverse fast synchro): 300KHz
Input voltage = 0V : laser "OFF" Input voltage = 5V : laser "ON"

Input Impedance: >1 kΩ
Rise/Fall time: < 10 µs for S and RS, < 0.8 µs for FS and RFS

Power adjustment curves



- The curves are typical and can vary depending on the laser model
- The shape of the curves can be customized:
  - Different slope
  - Different voltages giving maximum power or no power

*Not available on all models.

Separate electronics option

The electronics of the laser can be separated from the main unit. See diagram 'SNF laser with separate electronics option' on the next page for details. Use code "SD".

Ordering Information

SNF lasers are covered under a 2-year warranty (parts & labor). To order, use the following code: SNF - Pattern ("L" for Line, "H" for Crosshair, "D" for dot, etc.) (Interbeam Angle) - Wavelength & Power Option (if applicable) - Diode Power - Fan Angle (for lines) - "SD" for Separate Driver Electronics option (if applicable). E.g., **SNF-503L(1.5°)-635T-1-20-SD**. Improve line uniformity to ± 25, 20 or 15%, depending on laser model (request this option at the time of order). Call us or visit our website for updates and other specifications.

Pattern		Interbeam angle[(a)]
501L or 701L	1 line	–
503L or 703L	3 lines	1.5°, 5.0°, 11.7°
505L or 705L	5 lines	0.23°, 1.55°
509L or 709L	9 lines	0.11°, 0.07°
511L or 711L	11 lines	1.5°
515L or 715L	15 lines	2.3°
519L or 719L	19 lines	0.77°
533L or 733L	33 lines	0.09°, 0.38°
565L or 765L	65 lines	0.41°
599L or 799L	99 lines	0.149°
501S	1 square	2.9°
504G	4x4 grid	2.44°
501H	crosshair	–
501C	1 circle	0.77°, 11.4°
507C	7 concentric circles	0.77°
507X	7x7 dot matrix	1.9°
519X	19x19 dot matrix	0.77°
Custom		

Standard Wavelengths & Diode powers	
635 nm	1, 5, 10, 15, 35 mW
660 nm	1, 5, 10, 20, 35, 50, 100[(c)] mW
685 nm	50 mW
690 nm	20, 35 mW
785 nm	20, 35, 75, 90 mW
810 nm	100, 200 mW
830 nm	30, 100, 150 mW
Custom	

Fan angle
1°[(b)]
5°
10°
15°
20°
30°
45°
60°
75°
Custom

Please visit our website or call us for an updated list.

(a) The interbeam angle is specified at 670 nm. The angle is proportional to wavelength. For example: (830/670) x 0.77° = 0.95° at 830 nm

(b) Not standard for crosshair projector

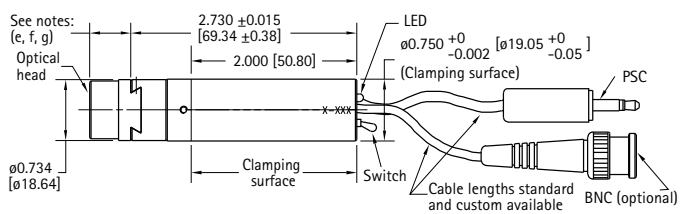
(c) Only available with the 701L lens

Other wavelengths and diode powers are available. Please call us for more details.

- **Ask us about the Interbeam Angle Doubler, a structured light pattern expander with high beam-to-beam uniformity.**

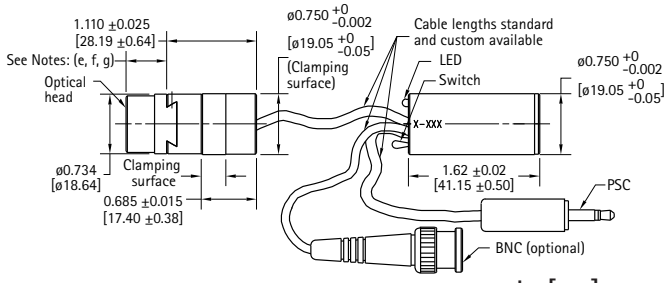
Dimensional Diagrams

Standard SNF Laser



Notes: (e) Add 0.500 [12.70] for the 501L series of pattern generators
(f) Add 0.750 [19.05] for the 701L series of pattern generators
(g) Add 1.200 [30.48] for the 701L series with a type 2 collimating lens

SNF laser with separate electronics option



in. [mm]

Some combinations of specifications may result in different dimensions. Patents: US #4,826,299 / CAN #1,276,827 / US #5,523,889 / Other patents pending

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