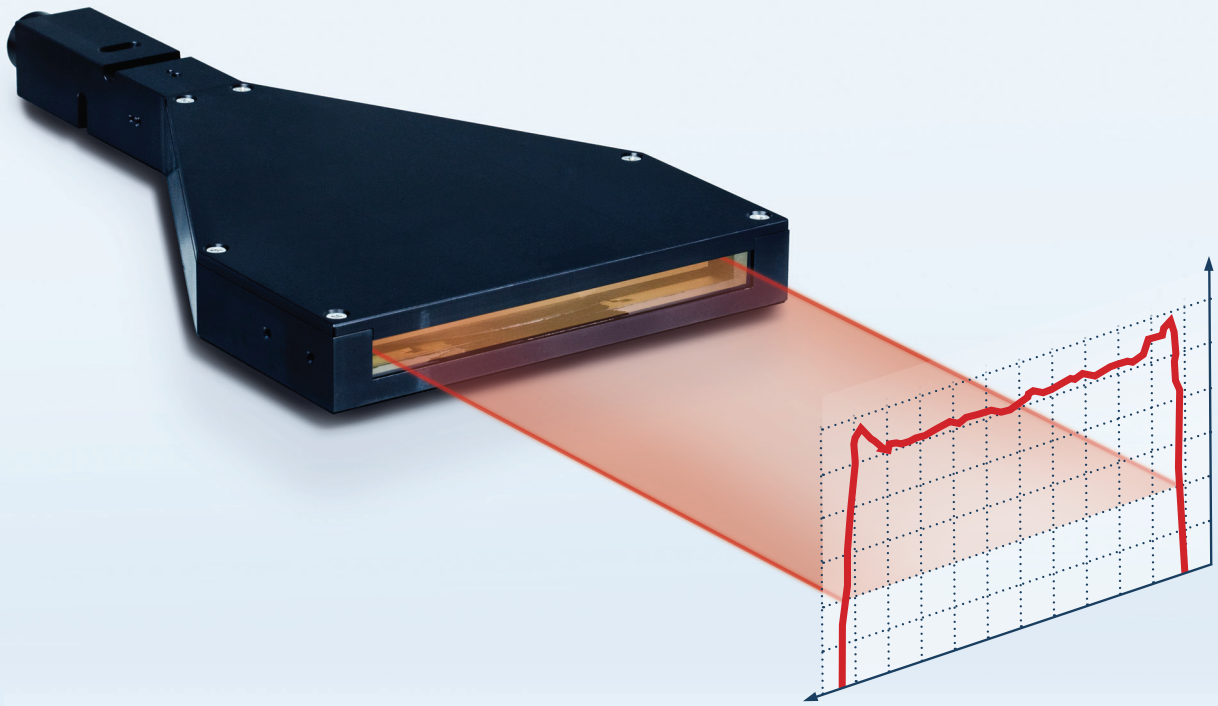
Osela Inc.

STRUCTURED LIGHT AND
LASER BEAM SHAPING SOLUTIONS

# TELECENTRIC LASER PROJECTOR

Telecentric micron thin line projector for high precision 3D structured lighting inspection applications.

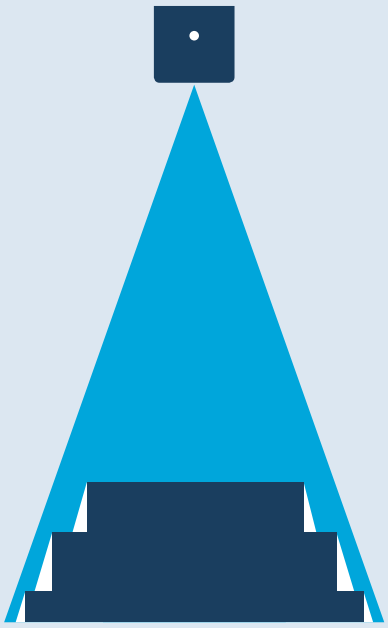


## FEATURES

- Constant thickness over entire line length
- Collimated line length
- Reduced image occlusion
- Line thickness down to 5µm
- Line length up to 100mm
- Uniform line intensity profile

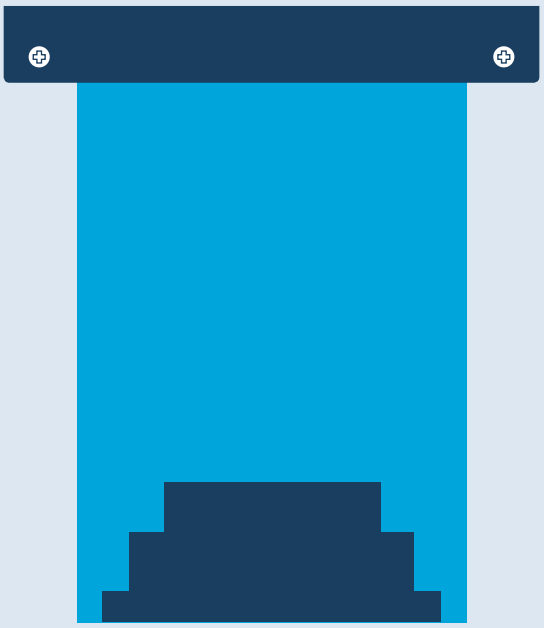
Telecentric Laser Projector (TLP) provides parallel non angular laser line illumination as opposed to conventional lasers lines that projects a diverging fan. The TLP has the advantage of reducing object occlusions on your image plane critical for 3D high precision structured lighting applications. In these applications the TLP evenly illuminates the complete part under inspection in order to achieve the measurement accuracy required.

## STANDARD LASER



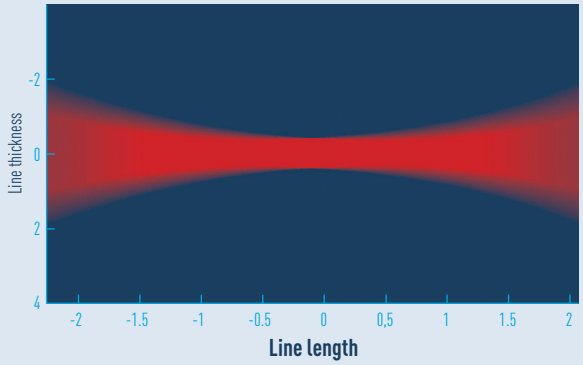
Object occluded

## TELECENTRIC LASER



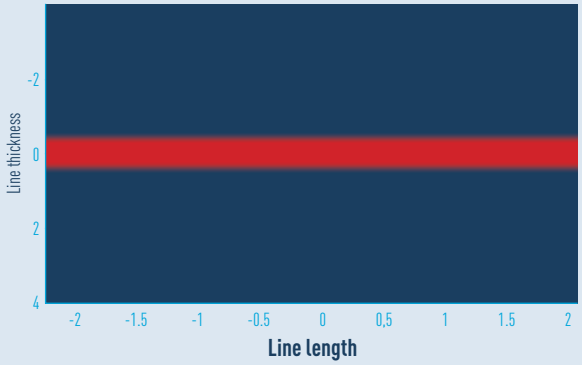
No occlusion

## INTENSITY DISTRIBUTION ON A FLAT SCREEN AT FOCAL POSITION




**Varying line thickness**

## INTENSITY DISTRIBUTION ON A FLAT SCREEN AT FOCAL POSITION




**Constant line thickness**

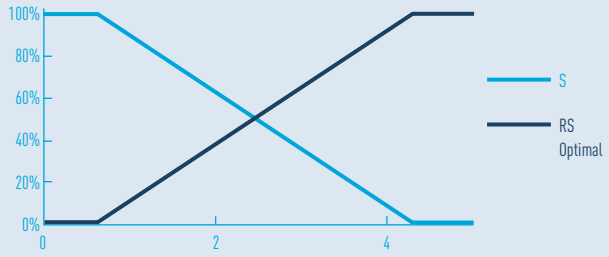
Another advantage of the TLP is that its thickness is constant over its entire length. In applications such as semiconductor inspection, it is very important to have micron thin line over the entire length. With conventional fan out laser lines it is not possible to have both a thin line over a wide field due to depth of focus limitations. With the TLP, its parallel non angular illumination design allows for constant micron thin lines over large field of views.

# MODULATION

The Telecentric Laser Projector can be modulated by an external 0 to 5V external signal through the white wire. The **S type** modulation is included by default with the Telecentric Module.

| FUNCTION | CODE | ON | OFF |
|---|---|---|---|
| TTL | T | 0 to 2V | 3 to 5V |
| Reverse TTL | RT | 3 to 5V | 0 to 2V |

Note: One modulation input needs to be selected, S (default), RS, T or RT

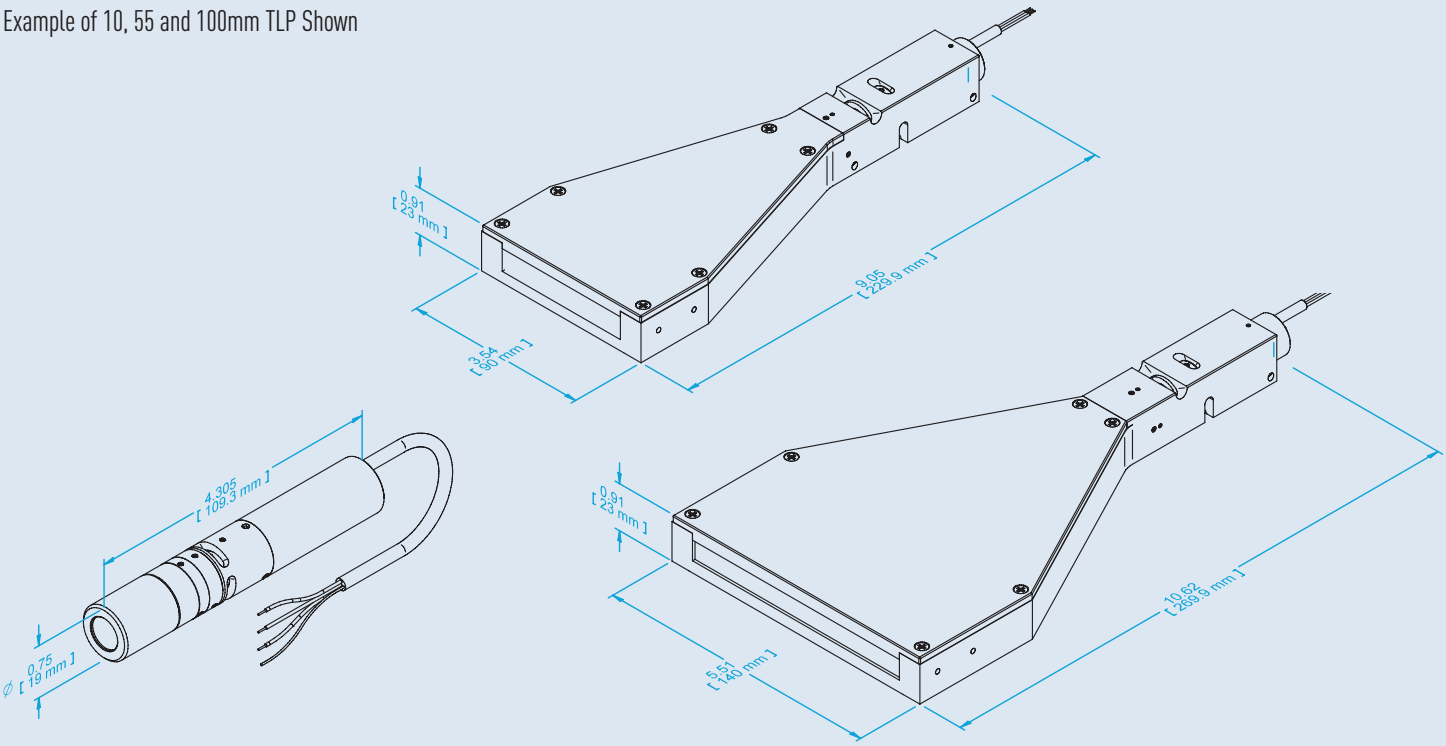



# SPECIFICATIONS

| | |
|---|---|
| Bore sight (mrad) | < 3 mrad |
| Wavelength Drift | ≈ 0.25 nm/ degC |
| Pointing Stability | < 6 µrad/°C |
| Modulation Rise/Fall time | < 5µ sec, 100% modulation depth (10 Kohm input impedance) |
| Protections (Built in) | ESD, Over voltage (up to 30 VDC), Over-temp Shutoff (> 50 deg C) |
| Long term Power stability (8 hours) | < 3 %, 2 minute warm up time |
| Operating Voltage | 5 ± 0.5VDC, 4.5 to 30V Optional (9-30V for < 635 nm) |
| Working Temp Range | -10 to to +50 °C (housing) |
| Weight | < 1500 g |
| Power Supply Cable | 18 inches 3 conductors Belden 9533, with flying leads |
| ESD Protection | Level 4 |
| Shock Tolerance | 30g, 6ms, functional |

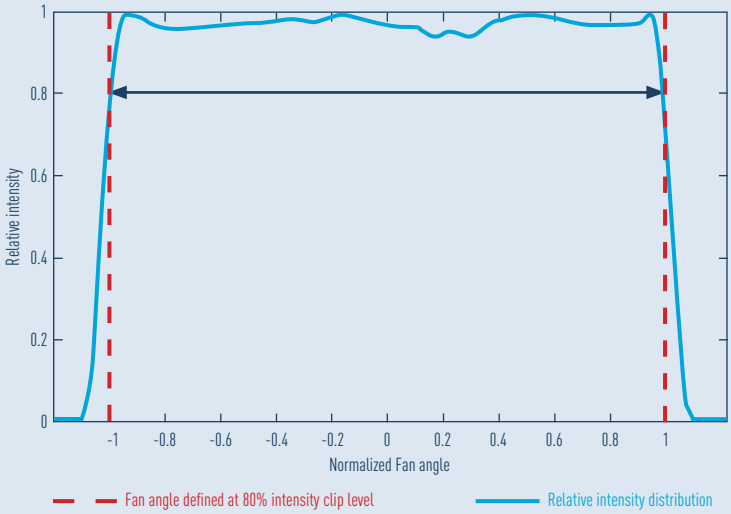
# MECHANICAL SPECIFICATIONS

Example of 10, 55 and 100mm TLP Shown

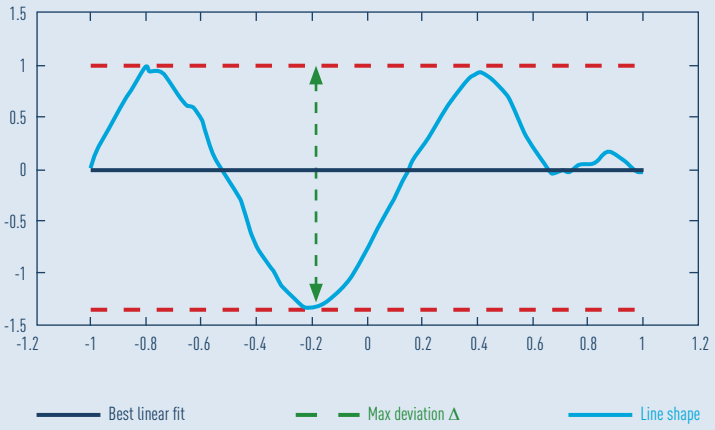


# TELECENTRIC SINGLE LINE GENERATOR

## FIG 1 - INTENSITY DISTRIBUTION ALONG THE LINE




## FIG 2 - LINE STRAIGHTNESS




# SPECIFICATIONS

| SPECIFICATIONS | | VALUES |
|---|---|---|
| Uniformity<br>(line intensity distribution along the line) | $\frac{Imax - Imin}{Imax + Imin}$ | 20% (typical) |
| Relative intensity clip that define the fan angle | | 80% |
| Contained energy<br>In the fan angle | $\frac{\text{Energy in fan angle}}{\text{total energy}}$ | ≥95% |
| Line Straightness<br>(deviation from the best linear fit) | $\frac{\Delta}{L \text{ (line lenght)}}$ | ≤0.1%<br>≤0.05% |

# ORDERING CODE Please contact us for laser configuration assistance

| TLP - | XXX<br>Wavelength | - | XXX<br>Diode Power | - | X<br>Electronic | - | X<br>Line Length | - | XX<br>Line Tickness | - | XXX-XX<br>Working Distance | - | XXXXX<br>Option |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 405, 450 | | 1 | | S | | Up to | | Down to | | To specify | | SD |
| | 520, 635 | | to | | RS | | 100mm | | 5µm | | | | 24V |
| | 660, 830nm | | 260mw | | T | | | | | | | | |
| | | | | | RT | | | | | | | | |