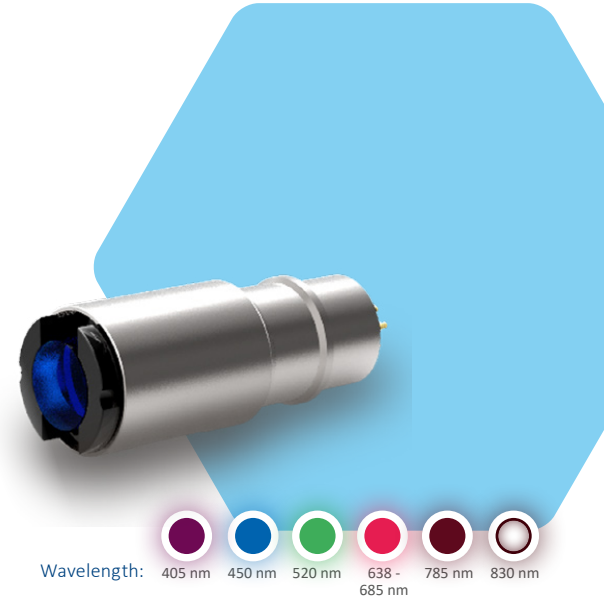


ZX10-LD & ZX10-ND

Small size, high performance

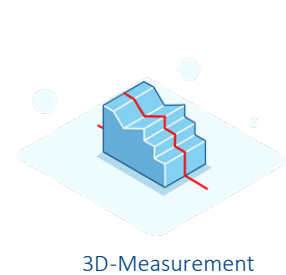
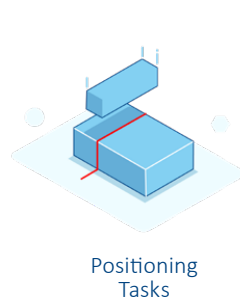
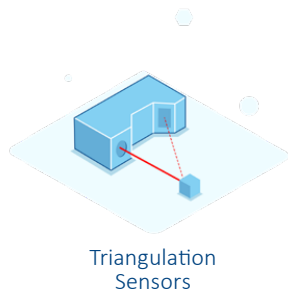
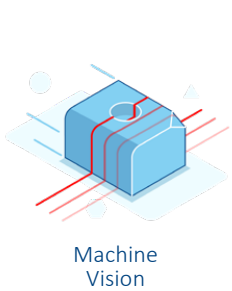
The ZX-laser series offers diverse, application specific customization possibilities. The user can choose from violet to infrared wavelengths depending on the application and materials to be inspected. The focusing optics achieves a boresight of less than 0.8 mRad. The industrial-suited design along with stable performance works perfectly as an integrated module in machine vision applications, sensors or processing machines. The laser module contains no driver electronics (ZX10-ND) and is therefore ideally suited for OEM applications. Upon request, licensing and integration of the Z-LASER electronics can be provided (ZX10-LD).



- IP 50
(IP 67 optional)
- Boresight
Accuracy
- High Process
Reliability
- Compact
Size

Highlights

- Repeatable high product quality due to automated production processes
- Optical output power up to 200 mW
- IP 50 (optional IP 67)
- Highest reproducibility of beam quality
- Wavelengths from 405 nm - 830 nm
- ZX-LD = "License driver"
- Fixed focus
- ZX-ND = "No driver" (optic / diode package)



Order Code

Z??	X10	?	?	?
Power	Product family Size of head	Electronics	Wavelength	Optics

System specifications

Wavelength	nm
Wavelength tolerance	nm (typical)
Wavelength drift	nm / K (typical)
Output power (elp)	mW
Spatial mode	(typical)
RMS noise (20 Hz to 20 MHz, typical)	%
Peak-to-Peak Noise (20 Hz to 20 MHz, typical)	%
Boresight error ⁽¹⁾	mrad (typical)
Line orientation ⁽²⁾	mrad
Pointing stability	μrad / K
Long-term power stability (24h)	%
Start-up time	μs
Laser operation mode	

	405	450	520	635-685	785	830
	±10	±10	-5 +10	±10	±10	±4
	0,06	0,02	0,06	0,25	0,25	0,25
	≤ 160	≤ 60	≤ 40	≤ 160	≤ 80	≤ 200
Single Transverse Mode						
	< 0,5					
	< 1					
	< 0.8					
	< 10					
	< 10					
	±3 over operating temperature range					
	< 70					
	Dependent on the LD driver					

Optical specifications

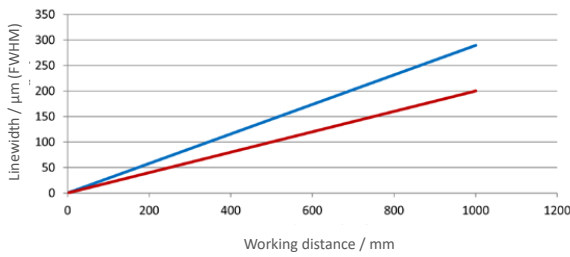
Fan angles ⁽³⁾	Degrees °
Line straightness ⁽⁴⁾	% (of line length)
Line uniformity ⁽⁵⁾	% (typical)
Dot	
DOE	
Focus range	mm

	10, 20, 30, 45, 60, 75, 90 (homogeneous line)
	< 0.08
	< 25
	Point elliptical
	Multi line, crosses, grids, etc.
	< 100 up to 10,000 (only available as fixed focus)

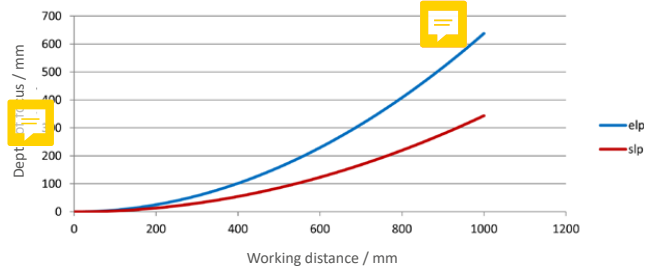
Keynotes

¹ Boresight error	Also known as pitch and skew
² Line orientation	Also known as line tilt (roll), with reference to the indentation in the clamping area
³ Line length / fan angle	at > 13,5 % I _{max}
⁴ Line straightness	Deviation from best fit line over the middle 80% of the line, for homogeneous lines
⁵ Line uniformity	Maximum relative optical power variation over the middle 80% of the line, for homogeneous lines and fixed focus

Line thickness vs. working distance*



DOF vs. working distance*



Wavelength		Calculation factor for line width		Calculation factor for depth of focus	
		<i>slp</i>	<i>elp</i>	<i>slp</i>	<i>elp</i>
Blue	405 nm	0.82 ✓	0.82	0.70 ✓	1.02
Blue	450 nm	0.67	1.83	1.74	4.29
Green	520 nm	0.78	1.20	0.80	2.61
Red	640 nm	1.28	1.00	1.70	0.95
Red	660 nm	1.00	1.00	1.00	1.00
Red	685 nm	1.68	1.40	1.97	1.99
IR	830 nm	1.30	2.11	1.03	2.20

Optical configurations for several line settings are available.

elp = standard line Powell; standard setup with medium line thickness and depth of focus.

slp = extended line Powell; lines with advanced depth of focus and thicker lines. Recommended for fan angles > 75° at working distances < 500 mm.

The graphs above show the values for line width and depth of focus of a 660 nm laser. To get the values for a different wavelength the factor from the table above has to be multiplied by the values from the graphs.

Example: 660 nm laser focused at 500 mm working distance: line width approx. 150 μm (@ *elp* optic); Depth of focus approx. 175 mm (values from the graphs)

Calculated: 405 nm laser focused at 500 mm working distance: line width approx. 150 μm x 0.82 = 123 μm; Depth of focus approx. 175 mm x 1.02 = 179 mm

* Values in the graphs for homogenous line profiles

** Fan angle: 10° - 90°

Environmental conditions

Operating temperature	°C / °F
Storage temperature	°C / °F
Humidity	%
Dissipated heat	W
Shock and vibration	

Depending on laser diode
Depending on laser diode
< 90, non-condensing
Depending on laser diode
According to IEC EN 61373:2011, cat. 2

Mechanical specifications

Weight	g / lbs
Length	mm / inch
Diameter head ø	mm / inch
Connection	
Material	
Protection class	

10 / 0.02
22.5 / 0.89
10h7 / 0.39
LD pins
Stainless steel
IP 50

Model: ZX10-LD | ZX10-ND

